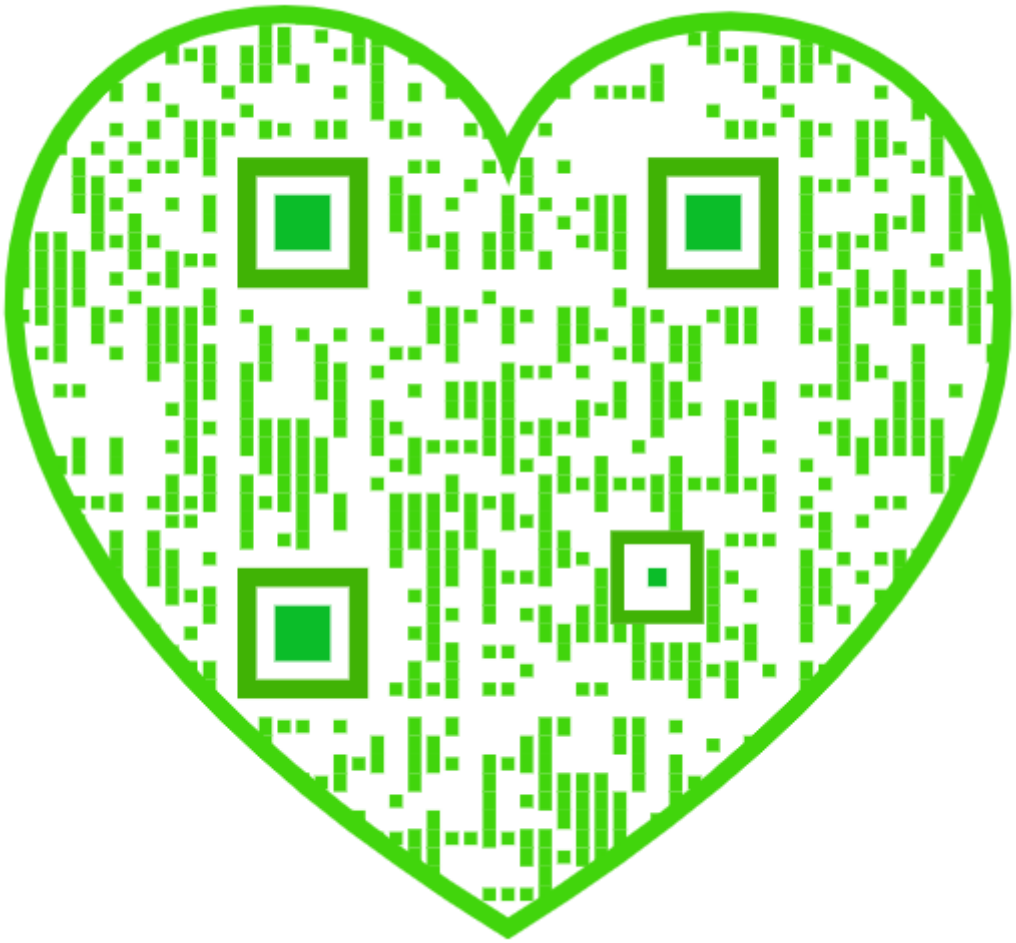

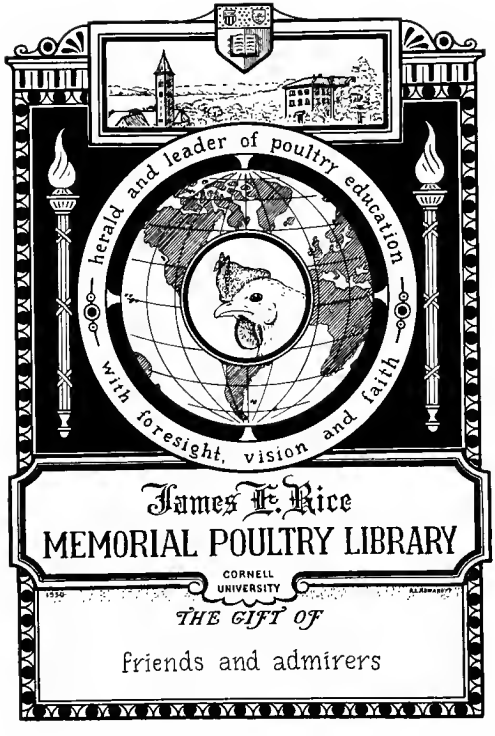

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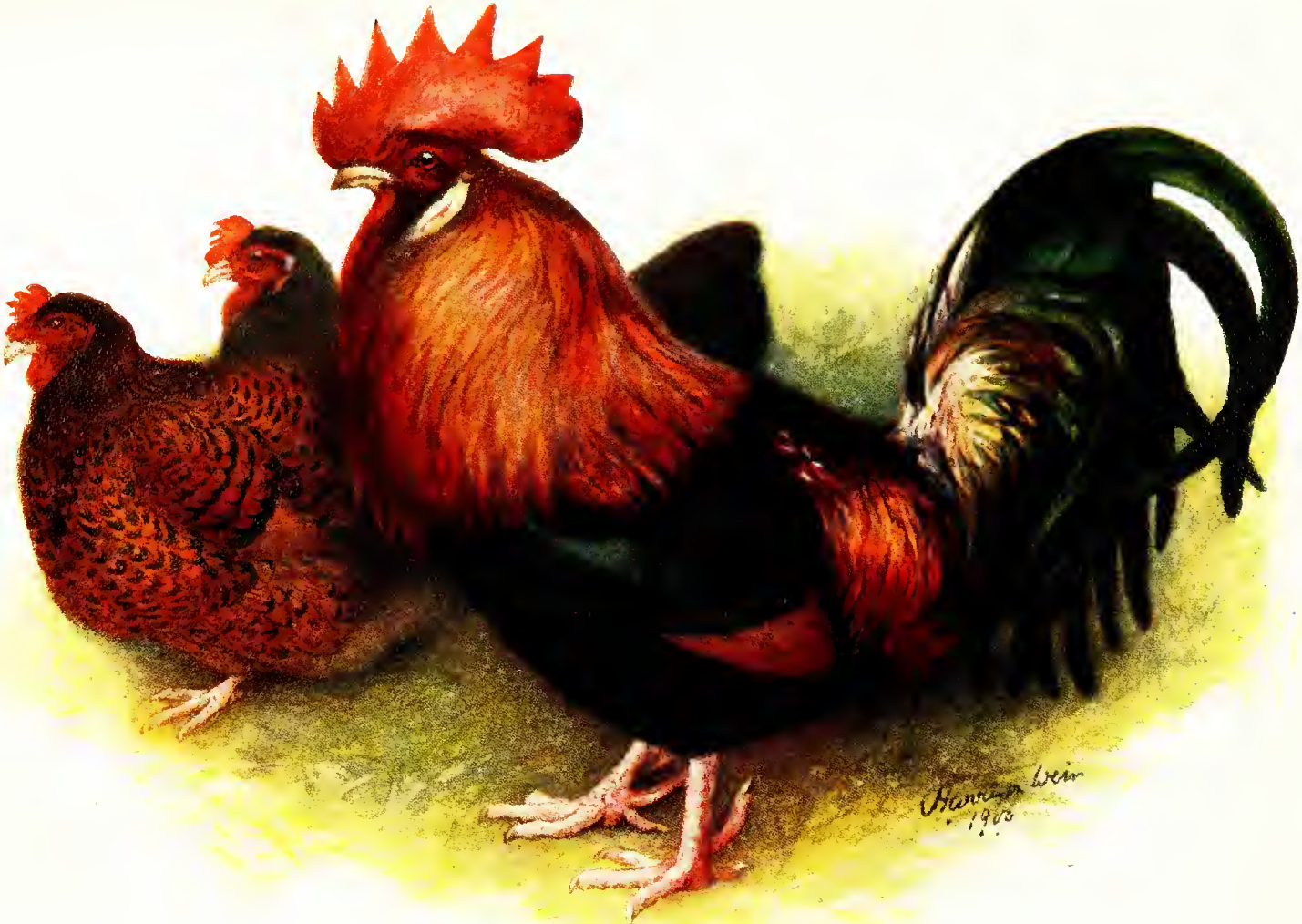
Harrison Weir
1903

The Poultry Book

By

HARRISON WEIR, F.R.H.S.

American Edition Edited by

WILLIS GRANT JOHNSON

Assisted by

GEORGE O. BROWN

as Associate Editor

and

Many American Experts

Complete in Eighteen Parts

NEW YORK

DOUBLEDAY, PAGE & COMPANY

1903

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This part has been revised and partly rewritten from the American point of view by American experts.

"The Varieties to Keep"
GEORGE O. BROWN, Maryland

"Mating and Breeding"
I. K. FELCH, Massachusetts

AMERICAN EDITION

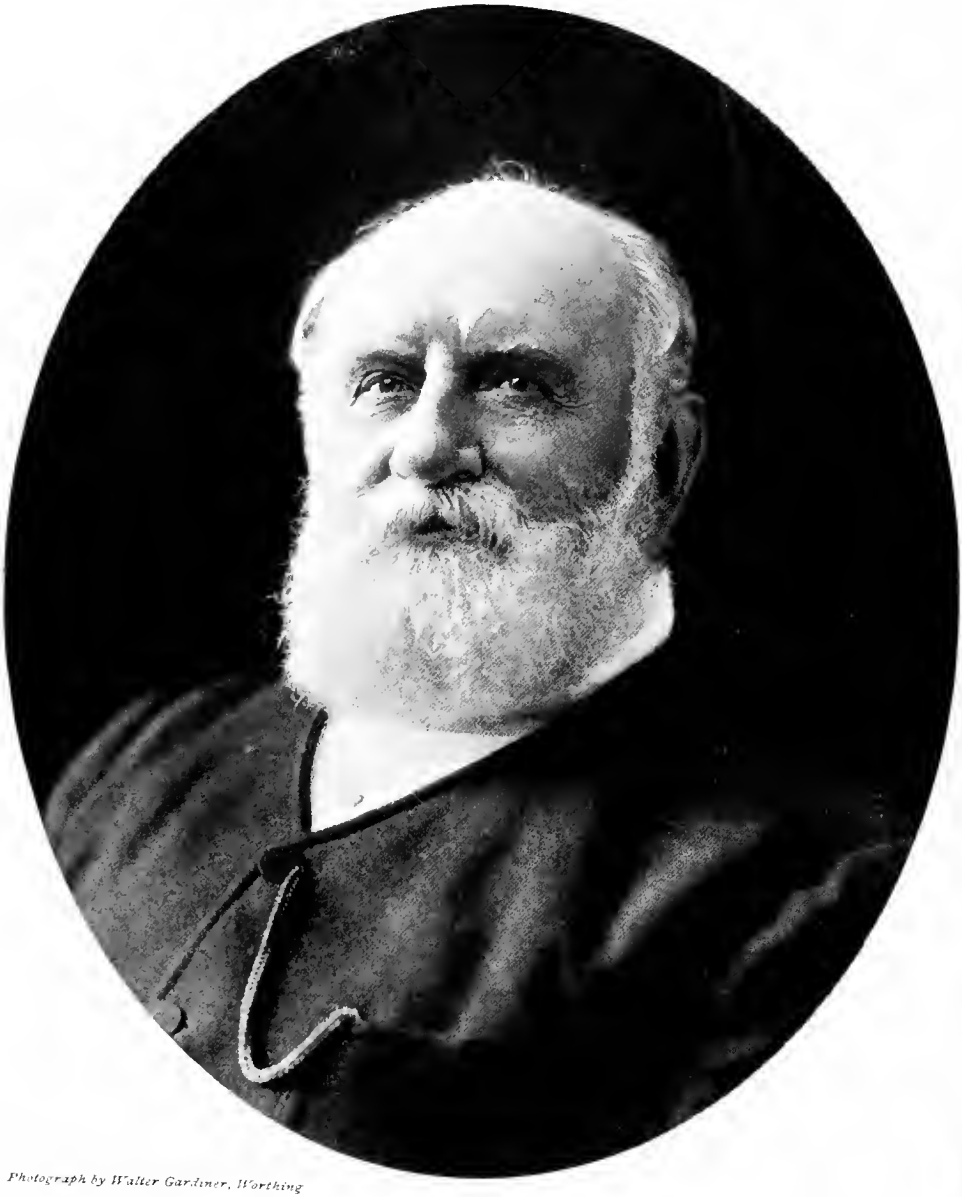
EVERY person in this country who has given the subject of poultry serious study, either as a professional or an amateur, is familiar with the writings of the venerable and highly esteemed English writer, Mr. Harrison Weir. It is a great satisfaction to all lovers of poultry to know that the results of his observations and personal experiences, covering more than half a century, have been preserved in the present volume. In very few instances do we find so keen an observer and such a close student of Nature the possessor of such rare artistic ability. The work is therefore all the more valuable, containing as it does his sketches and drawings, and it will remain a standard in its class of literature.

The poultry industry in America has been one of gradual development. On account of peculiar conditions, the methods in vogue here differ considerably from those followed in England. Therefore, to make this work of more peculiar interest and value to American breeders, each part has been thoroughly revised and, in some instances, entirely rewritten, by an expert American authority.

The insertion of photographs and drawings representing typical fowls from an American point of view adds to the great value of the work as one of reference. In fact, it constitutes, in its present form, a standard for all lovers of poultry. In each instance the name of the authority is printed at the head of the chapter, and he alone is held responsible for the comments and revision. Where no individual credit is given, the editor is authority for any changes in the original English edition.

WILLIS GRANT JOHNSON.

New York City, May 1, 1903.



Photograph by Walter Gardiner, Worthing

With all good & Kind wishes

I am Yours Most Truly,

Harrison Weir

1902

From a photograph "*Commercial Poultry*
WHITE PLYMOUTH ROCK COCK

PREFACE.

"There is nothing among men perpetual nor nothing stable, but all things pass and repass, even like unto the flowing and ebbing of the sea."—SALLUST.

AS A CHILD I was ever happy, contented and amused by the companionship of animals and birds, particularly fowls.

At the time that my only brother* and myself were quite "little things," our father would make outline pencil drawings for us to copy. These, by our desire, were mostly "cocks and hens." No stories pleased us so much as those of the wild and tame animal life of the woods, hedgerows and the farm, and none like those that told of the Kent and Sussex homesteads, with their cattle, bird and poultry associations.

Early in May, 1829, when scarcely five years old, I traveled with my mother by coach to Tunbridge Wells, and thence by a hired conveyance along the Hastings road to Pembury, another mile; then up a long, narrow, wheel-rutted, sanded lane, whose high and low side-banks and hedges amid their greenery fairly glowed with the rich and rural colorings of spring, through a five-barred gateway, past a pond darkened by overhanging trees, a wider and more open space of the grass-fringed trackway, and we were at "Fletchers'," the ancient family home of a near relative: an old-world, primitive, half-stone, brick, timber and weather-tile built house,

* John Jenner Weir, F.L.S., F.Z.S., F.E.S., etc.

AT THE OLD FARM

thatched out-buildings, barn, cart-house and piggeries, with a surrounding of hop gardens, arable, meadow and other cultivated land. The homestead was some centuries old, also the out-buildings; fields were scattered among woods, joining other woods in almost never-ending variety of forms and masses, while in front of the leaden casement-windowed house was the trim and gay flower garden, defended from cattle and other incursions by the whitest of wooden palings. A thrush sang amid the trees of the blossomy orchard close by, and a chaffinch gave voice from a lilac bush. All about was old, even the very fruit-trees, and yet to me—so new. To this day everything I saw and heard is as fresh and as bright in my memory as though it were but yesterday; the house, the woods, the hedged-in fields, the birds, the wild and garden flowers, were to me then, as now, a very wonderment of lovable things and an adorning beauty unadorned.

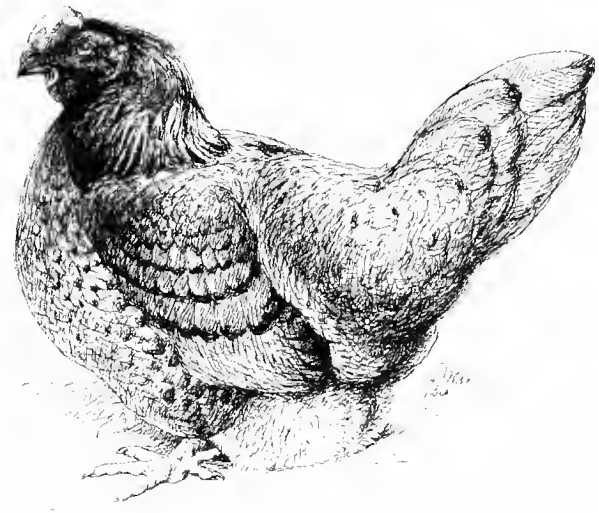
The day after our arrival I was missed, and by much searching found in the cowyard with a pencil and paper, endeavoring to draw "the cocks and hens." For many years these drawings, with their slight resemblance to fowls, were treasured and proudly shown by my mother. Here it was that I first saw the Kent and Sussex white-shanked five-toed black-and-red poultry, though kept and known at "Fletchers'" and some adjacent farms beyond time of remembrance. Years afterward I learned that the whole of the housekeeping expenses were paid out of the profits derived from the small dairy and—the poultry. From this time my love of animal life so increased that some fowls were got to please my brother and myself. Three Nankeen Bantams, and then some partridge-colored and "booted," were given to our father by Sir John Sebright for "the boys." Then Aylesbury Ducks, pigeons, rabbits, dogs, Guinea-pigs, piebald rats, fawn-colored, black and white mice, and a tame but very young squirrel were

purchased; and thus it was with my brother and myself no time was more enjoyable than that spent in attending to the wants and welfare of our various, somewhat incongruous animal and bird belongings; but the farm-yard, with its poultry, was ever the first and our most restful pleasure. Growing older and stronger, we wandered wide in search of variety in this our chief delight.

Many of our relatives and friends living in Kent and Sussex were farmers, and that chiefly of their own land or of large holdings; and it may be said that all, as a rule, kept the best of farm-stock, and the poultry was not only a profitable adjunct, but things of beauty of the highest excellence, whether for the table or for the production of eggs.

The farmer and the poultry fancier of to-day has but little or no idea of the superior and long-tested quality of the then ancient breeds of fowls nurtured and kept about our southern homesteads, nor how much they were cared for, appreciated and valued.

Both the cocks and hens were most carefully and thoughtfully selected, not only for their fineness of flesh, thinness of skin, their form and size, but also for their uniformity and beauty of color; in this respect districts and farms were known as having a certain specialty, and the fowls were not, as many modern writers ignorantly state, unculled or unmatched. In many cases the housewives were as proud, if not more so, of their poultry as any cattle-breeder was or could be of his cattle. Often would they take my brother and myself at the feeding-time into the poultry yard, and there point out the best, and tell us why they were the best, and what were their chief points of excellence, or their beauty of color or markings; and further tell us how the same kind and breed had



OLD KENT AND SUSSEX FIVE-TOED HEN

been kept and reared on the land for many generations; and also when some were killed, and plucked for the table for culinary purposes, we were shown what constituted a first-class fowl as regarded size, color of flesh, fineness of the fiber, thinness, whiteness and smoothness of the skin, the even distribution of the white fat, the squareness of the body — for none were then in favor of the long breast, as now advocated, and which latter is a mistake, as it must be generally wanting in depth; but with the shape then bred an exceeding plumpness of breast was obtained. The Partridge* was invariably quoted as "the model form" of what a fowl should be, with rather more leg and thigh, the shanks being in due proportion; and they one and all were most particular that the shanks (then called legs) should be white, and fleshy scaled, with feet five-toed white—even one dark nail was considered a blemish, and rejected as breeding stock. We were shown where to look for the hens' eggs, and trained in the feeding and rearing of chickens, and to note the times of feathering, the hen's pratings, cacklings and callings; the cock's crowings were talked of as noticeable as varying both in power and tone, and as indications of health and strength that were not to be lost sight of when choosing the birds of the year for mating as breeding stock.

Several methods of fattening the chicken were shown to us, and how to pluck a dead fowl properly, while the carving of one on the table was not neglected. All of this was well over "sixty years since"; and thus it has been that almost from very infancy have I grown into the knowledge and love of our "farm" and "fancy" poultry, and the which to me has been a source of everlasting pleasure both in thought and reality. Having kept almost every variety, not only have I studied fowls from a poulterer's view, but as a naturalist, and, lastly, as an artist, professionally and otherwise attending poultry shows, from that of 1845 at the Zoological Societies Gardens, and elsewhere to the present time, often acting as one of the judges, and have been also an exhibitor for nearly fifty years.† During this time I have seen, known and conversed with those fanciers of the far-off past as to what poultry was, and those breeders of the day as to what it now is, and thus by theirs and my own long and almost unique experience have gathered, I hope, a true and certain knowledge of the varieties of the breeds, both old and new. Such, I believe, should become

* Perhaps the Grouse would be in Scotland.

† Winning first prize for old English Game cocks, Crystal Palace, 1898.

historical; thus it is that I have endeavored not only to put together such facts that have come under my own actual observation, but also those made known to me by others that have been my friends and associates in bygone times, as well as those truthfully recorded by authentic writers in the

SKETCH AT THE OLD FARM SIXTY YEARS SINCE

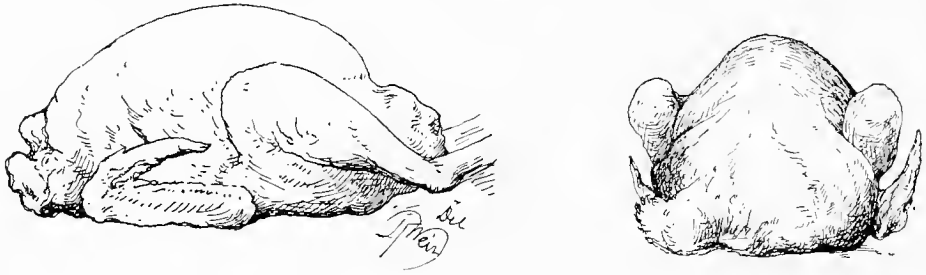
numerous books, mostly in my possession, my idea being to tell of, to portray or describe our different breeds of fowls as to what they were, and now what they are. This has been my conceit for more than forty years. Many long and serious illnesses, and work in other directions, has hindered much, and made progress slow, but the intention has gained in material, though in one sense it has unexpectedly lost in another, as I shall presently show. That I was writing and preparing an illustrated book on poultry had long been known, and that it would comprehend the past and present variations of the different breeds, but the full scope of its contents had not been defined to others, until in a friendly conversation between myself and the editor of *Poultry* (the late Mr. Broomhead), May, 1891, in which I gave him the general outline of what I was and had been doing, upon which he published the following in *Poultry*, May 22, 1891:

"Mr. Harrison Weir has for a long time been engaged in writing a poultry book, although illness has again somewhat hindered him. The work, which will be altogether different from the general run of poultry books, is a *resume* of more than fifty years' experience, and will show the variations of many of the breeds of fowls for a number of years in consequence of poultry shows, which, as is generally well known, Mr. Harrison Weir has contended for many years past has been the ruin of the commercial table fowls. For years past Mr. Weir has been making very carefully delineated drawings, which will accompany his descriptions of the birds. Game-fowls and Dorkings will occupy a prominent position in the work, a large amount of valuable and interesting information having been got together respecting these breeds."

This information having been freely given, I, and also many others, were somewhat indignantly surprised to find another book published in 1892 of nearly the same construction, and not only that, but using on the title-page almost the precise words that the editor of *Poultry* had written in May, 1891, regarding my book from the information that I gave him.

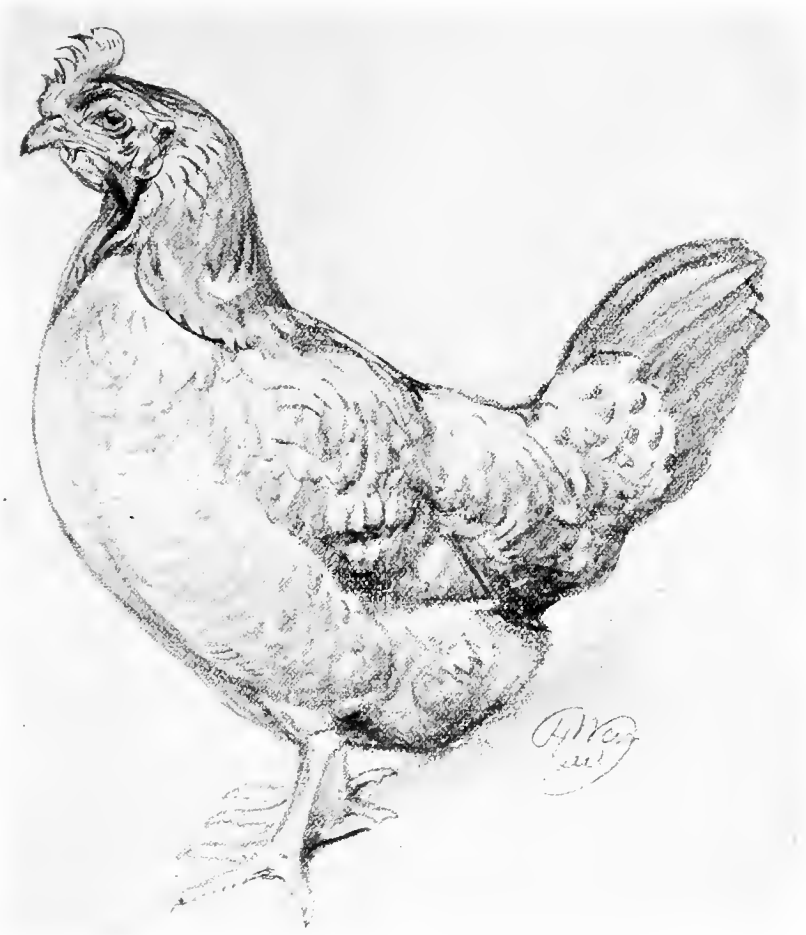
I only quote the above fact to clear myself from any imputation of plagiarism at least on my part, and for no other reason. The above carries its own comment, therefore any from me is needless.

Upon this, I thought it best to abandon my book, though the work of many years' research, much thought and a lifelong experience; so for the



PARTRIDGES

time at least it was abandoned, and only resumed at the earnest entreaty of some dear friends, and though from ill-health and various other causes the work has been slow, and at times almost tedious, it is at last completed, and I most sincerely trust and hope that as it has been a labor of love,



OLD STYLE OF KENT AND SUSSEX FOWL

with all its faults and shortcomings it may prove to be both useful and interesting; also, being partly historical and biographical, it may be found instructive.

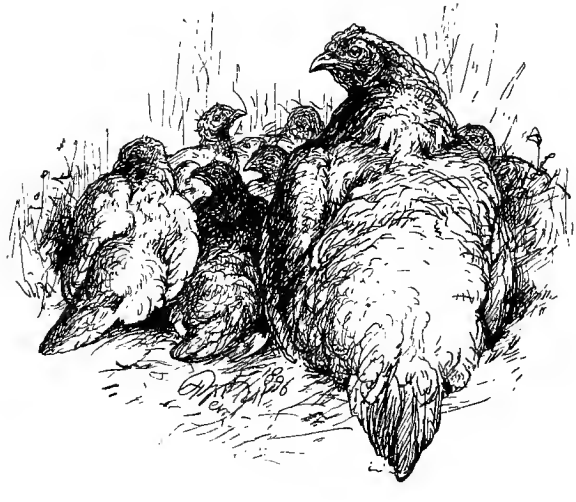
The antiquarian portion is selected from a mass of notes taken from old books, Middle Age inventories, records, and from various other sources, and which I trust will be found acceptable, and at one and the same time convey to the fanciers, poultry keepers and poultry writers of to-day that, without doubt, and whatever may have been said to the contrary, for many centuries at least our poultry was not merely one of the neglected appendages of the villa and farm, but was chosen and bred with much care, atten-

tion and discretion, and that not only as a source of profit, but also for pleasure and even sport; and that before any poultry shows existed there were fanciers, and the table fowls of Kent were noted in history, and these, with those of Sussex and Surrey, were truthfully pronounced by competent judges to be as "table fowls, the very finest and best in the world."

I have only to add that the birds delineated are portraits and not ideals, and that latterly, to insure as much accuracy as possible, photographs have been used in every instance where procurable. For many of these I am lastingly indebted to several of our principal poultry breeders and fanciers, and their great kindness in having their birds photographed especially for my use, and for which and other gentle courtesies I tender my most hearty and sincere thanks.

HARRISON WEIR.

August 9, 1902.



INTRODUCTORY REMARKS

HEAD OF WHITE PLYMOUTH ROCK COCK
Owned by U. R. Fishel, Indiana.

FOWLS (*Gallus domesticus*, Buff.); Guinea-fowls (*Numida meleagris*, Lin.); Turkeys (*Meleagris gallopavo*, Lin.); Geese (*Anser anser*, Lin.); Ducks (*Anas boschas*, or *domestica*, Lin.). These in their varieties represent the chief if not the whole of our useful domestic birds, and it is a curious fact that they originate in the four quarters of the world, the first coming from Asia, the second from Africa, the third from America, while the last two are European.

And it is no less remarkable how well each and all, by their many naturally valuable properties and habits, are so thoroughly adapted for domestication, no other families of birds, with the exception of the pigeon, lending themselves as readily to an almost if not an entire domesticity. True it is that the Turkey with us has comparatively not long been known as such, nor even now is it entirely rescued from its wild state; nor is the Guinea-fowl at present so perfectly under the control of man as the Goose, the Duck, or more especially the Fowl. Centuries on centuries has the last been the useful associate of the country villa, the cottage, the homestead, or the profitable appendage of the farm. At all hands it has merited and received peculiar attention. History tells of it; poets have written in its praise; painters have pictured it; and on the very lips of our children its name is a household word. The cock, as a bird of omen, was held in reverence, and as such was cherished in the far-away dim ages of the past. In ancient as well as in modern times it was either a

AT COCK CROW

bird of sacrifice, worshiped for its valor, or dedicated to both gods and goddesses. It was used and abused for sport, and morals were drawn from its high and unconquerable courage. Though the cock was the emblem of strife, it was also that of nobleness, coupled with gentleness, dignity and honor. So regular were its habits that by its crowings the times of the night season were apportioned, and it was ever the wakeful harbinger of morn.

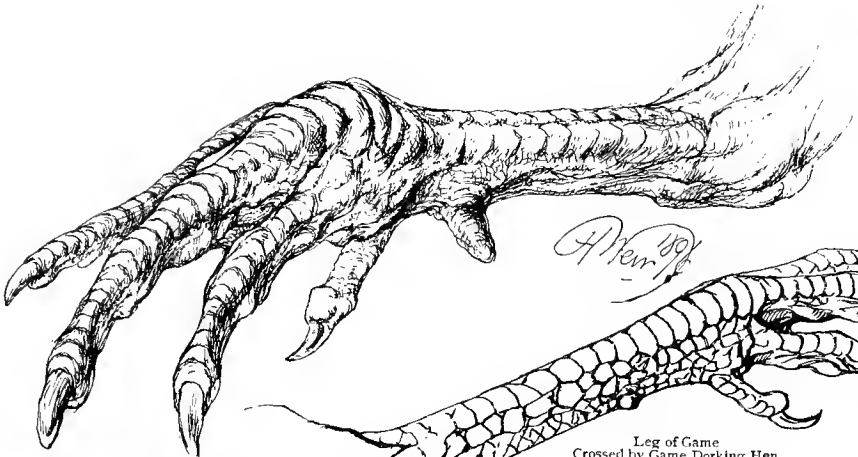
From the earliest ages its flesh and bones have been in many ways considered prime factors in the art of healing, and its feathers regarded as decorative, emblematical or useful.

Collectively with the hen its value increases. The eggs of the latter, though produced in abundant quantity, are still in an almost incredible demand, not only as an aliment, but as an absolute necessity in manufacturing, beautifying, finishing or purifying innumerable articles, fabrics and liquids that more or less form a part of our daily wants or supposed requirements. As a matter of fact, there appears to be scarcely any limit to the various purposes to which hens' eggs may be put, for the reason that as yet no real substitute for the albumen which they contain has been discovered; they remain the one and only substance necessary for the production of much in commerce, through the progress of civilization, luxury and invention.

The fact must not, however, be overlooked, that for the major part of the eggs thus used we are dependent on foreign sources. Our own industries and traffic have created also a profitable industry for other countries, even those at considerable distance from our own, which by a careful organization are enabled, after paying all charges of cost and transit, to come in competition on our markets, and sell at a lower price than that of the home produce.

Now, how is this done? Why is Russia able to compete with us on our markets in our own country successfully? I can only give two reasons: one is "barter," and the other "organization." In other words, it is a matter of exchange of goods more than money; so that the profit is possibly, at least partially, made on the export as well as the import.

As food the egg is unsurpassed, while the flesh of the fowl commands and receives an almost universal recognition of a delicate, delicious superiority all its own. Both for the young, the middle-aged, the weak, the strong, the invalid and the aged there is no difference of opinion as to its

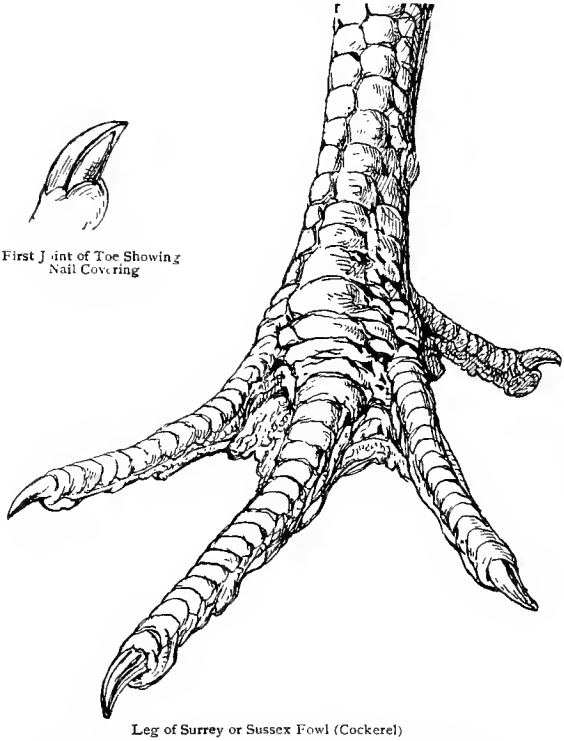


Azeel's Foot and Shank (Cock).
Owned by Author

Leg of Game
Crossed by Game Dorking Hen.
Bred by Author

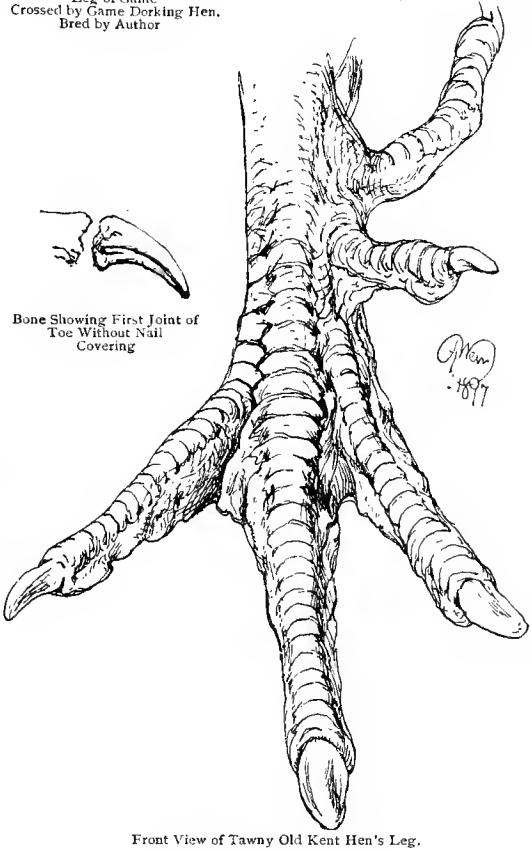
First Joint of Toe Showing
Nail Covering

Bone Showing First Joint of
Toe Without Nail
Covering



Leg of Surrey or Sussex Fowl (Cockerel)

Pure white and white Toe-nails; Fore Toe same length as Shank; side Toe as long as the Middle Toe, to end joint; Hind Toe just has the length of Side Toe; Out Toe 4, Middle 3, Inner, 2 joints



Front View of Tawny Old Kent Hen's Leg.
(Observe the breadth of Toe-nail)

GROUP OF LEGS (SHANKS) SHOWING THE VARIETY OF FORM IN DIFFERENT BREEDS

dietetic, nutritious and appetizing qualities, and that it has ever been appreciated is amply demonstrated by many of the earliest records.

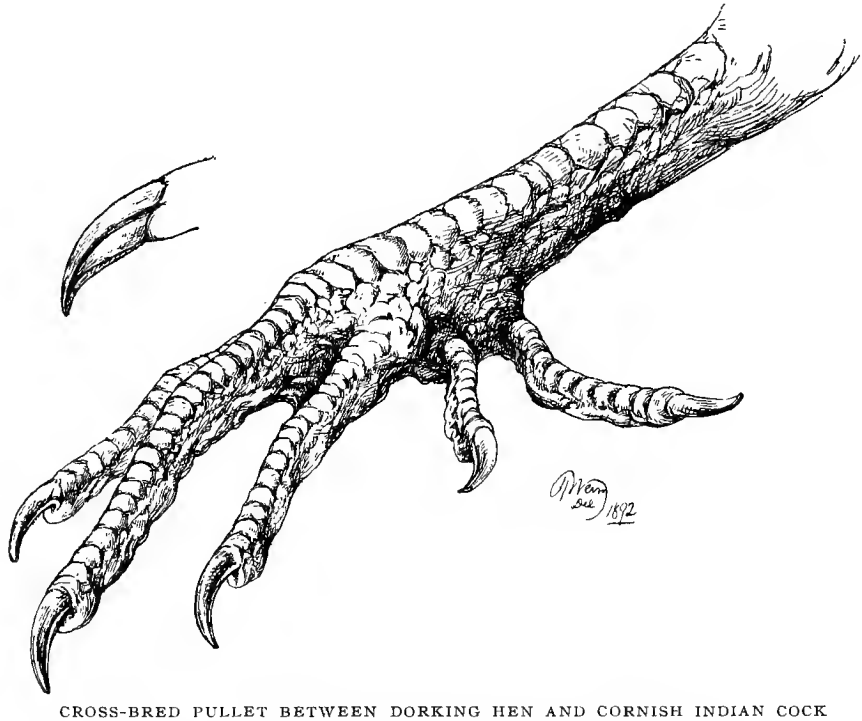
Though fowls as gallinaceous birds perch and even roost on trees, yet in their characteristic habits they are birds of the ground; and it is there they search for food, which especially consists of grains, seeds, roots, berries, the tender tops and leaves of shrubs and vegetables, not excluding insects and their larvæ, worms, and even small mice. Their limbs are strong and well knit, and capable of much sustained action, the muscles being well and fully developed. The legs and thighs are of medium length, and their shanks are covered with protective scales, sometimes concealed by feathers, while for defense they are occasionally armed in both sexes with sharp and often lengthy spurs. The three front or anterior toes are by their strength and formation well adapted for raking, scraping or scratching, being furnished with strong claws or toe-nails of peculiar form, with cutting edges, while the arched concave and convex of bone in the inner centre prevents all chance of bending; the hinder toes (and there are two or three more in some cases) scarcely more than touch the ground, and are serviceable for perching, though less so in walking.

They never wash, as many other birds do, but cleanse themselves of insect life by shuffling in and throwing dust or soil amongst their feathers. The beak is stout, strong, somewhat hooked at the extremity, and is horn-covered. The body is very plump, the breast being full and rounded, with a deep keel to the sternum or breastbone, the more so in those so formed as to be able to use their wings freely and quickly in flight, while considerably less so in those that are large in the thighs and legs and long in shanks, which are more adapted for running and walking, the wings in these being short and concave. The head is generally surmounted by naked vascular flesh, or what is usually called a comb or crest, which is often deeply serrated, and in some instances very large, as are the pendulous wattles; in others these are almost wanting, their place being supplied by feathers either as beard, muffler or cops. In come cases the comb and beard are found; in others, large and full topknots of feathers and long pendulous wattles. With some the cheeks or faces are naked, while with others they are entirely covered.

They seldom if ever build any nest, though there are instances of such recorded. I had an old English spurred Game hen that actually carried straws, weeds, etc., in her beak for that purpose into a corner some little

height from the ground. According to the breed, they are more or less abundant layers of pure white, tinted brown or brown-and-spotted eggs.

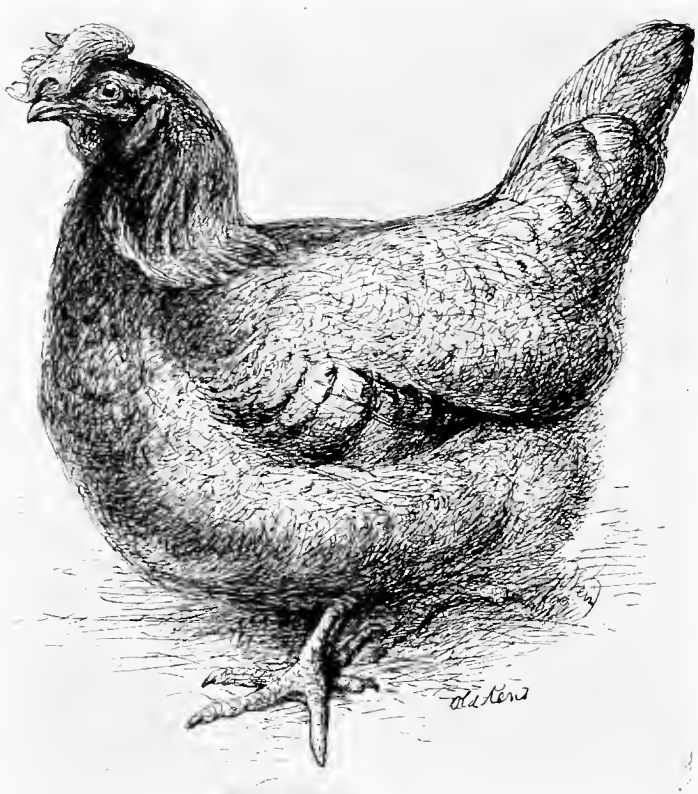
At what time the domestic fowl was first introduced into England is unknown, but there is a tradition in Cornwall that it was originally brought to that part of our coast by the Phenicians when they came to traffic for



CROSS-BRED PULLET BETWEEN DORKING HEN AND CORNISH INDIAN COCK
Age, 4½ months; Leg, white, stained with brown between the scales; Weight of fowl, 6½ lbs.; Inside fat, 2 lbs.
First Prize, Dairy Show, 1892.

tin and copper with the natives, previous to the Roman invasion; and to this day, in some parts of the country, it is called the Persian bird, but why this latter does not appear; and further, it is especially noted by Cæsar ("De Bello") that the Cock, the Goose and the Hare were among, if not the whole of, the domestic animals of the ancient Britons, and kept by them for pleasure only before his invasion of the country, but that soon after their scruples in this direction disappeared.

However that may be, it is certain the Romans brought with them the "fighting Cock," both to the south and the west of England; clear proof of which are the bones, nay, the very metal spurs used in their contests,



OLD KENT FOWL

that have been found both in Surrey and Cornwall. One metal spur was dug up in Southwark, and a pair in an old Roman wall in the latter county, besides others that unfortunately were not preserved or sufficiently noted.

From the time of the Romans, at least, until the present, fowls in lesser or greater numbers have been imported from Holland, France, Spain, Germany and Italy, and latterly more especially from India, China and Japan, and now from America, in variety and crossings almost bewildering. Yet with all these one curious fact remains, and that is, that the old English well-known breeds which have been attributed to the Roman introduction—the five-toed Kent, Sussex and Surrey fowls and the perfectly formed, valorous and beautiful "fighting Cocks," have up to within the last few years, if not even now, maintained their high character and superiority in England as the "best all-round" fowls ever known, and for table are still unequaled, and as such were universally admitted so to be before the institution of poultry shows, that have with them even now in the exhibits the blighting influences of Asiatic crossings.

Fifty years ago it was these breeds pure and simple, from the southern farmyards of Kent and Sussex, that the principal and justly praised prize

winners were chiefly taken, and where they were both in numbers and in such state of perfection as table fowls as commanded and retained the admiration of all who saw them. On the advent of the Shanghai, the Cochin, the Brahma, and some other Asiatic breeds, deterioration began, and there arose a craze for size; and as a consequence these coarse breeds were crossed and intercrossed with our old English; the result being our pure breeds—the outcome of centuries of cultured selection and attention, the perfected strains "of our forefathers" in past ages—were mongrelized, in some cases almost past recognition, and to-day scarcely a Kent, Sussex or Surrey farmyard holds a fowl of any pure breed. This is not merely assertion, but absolute fact; it is not hearsay, but what I have myself seen sixty years ago and by inspection lately.

And still the pernicious practice of mongrelizing goes on, the stream of ignorance or perversity grows wider and more overwhelming, reason is scoffed at, and conceit with party and individual gain rules for awhile, and there is but little hope of recovery from this bad state—this crossing so ruining to everything; for what with amateur lecturers, dealers and faddists, who have a craze for what they term "fresh blood," the outlook is gloomy indeed. The farmer has but to go among the southern farmyards, where formerly the poultry kept was of the best of marketable fowls, and note the wide and depreciated difference.

It must be clear to every observant mind that as the craze for mongrelizing is rampant and still gains credit with the credulous, that were it not for our poultry shows, our tried, serviceable, in all ways valuable pure breeds would very soon cease to exist—these old fowls of ours, the work of ages, the perfection of table fowls, the abundant layers of good white eggs, the beautiful, the grand, the stately, well-formed, delicate-fleshed, easily bred and easily fatted, unsurpassed, long cherished, for all their profitable uses. I say, emphatically, were it not for the poultry shows, these, and the like of these, would be things of the past, and to the lasting disgrace of the poultryman of to-day they would become extinct. Happily, so far there are some who know the double value of purity of breed, and it is to these and only these that the country can look for help to regain what is already comparatively lost—the old and enviable position of having the best and most perfect table fowls in the world.

As regards other poultry, of the Guinea-fowl it may be said that in flesh it almost, if not quite, equals the very best of fowls, and as such

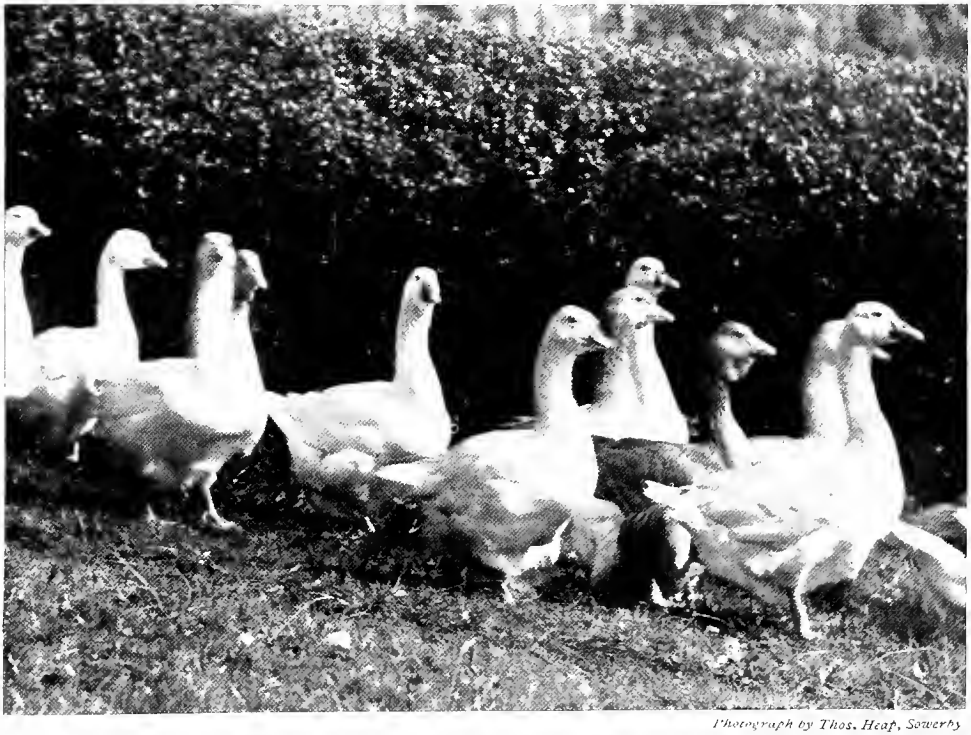
commands a good and ready marketable value, while at certain times of the year it is an abundant layer of delicately tinted palatable eggs. But its domestication is not even yet, and it is doubtful whether it ever will be, as perfect as that of the fowl, it being wild and wandering in habit, and more than somewhat difficult to manage with any degree of certainty and success.

The Turkey is indeed a noble bird, and ornamentally grand both in habit and carriage—the stately walk, the bold, imposing, haughty mien, the general aspect—the shivering quivering of its many-colored sun-glinting feathers into attractive array. While majestically it poses, turns and struts simply on its pride of beauty, it is a bird for admiration, noticeable, and something more than pleasing. In all ways the Turkey was a great gain and a lasting one. The flesh is delicious, white, delicate, juicy, and fine in grain; a well-fatted turkey poult is indeed a luxury. But the Turkey will not thrive on certain soils, and only in favored localities. The constant attention that the young chicks require until they feather is urged against it, but after the troublous time is past, and properly cared for, the little ones almost rear themselves. This being so, the English Turkey may be grown profitably, having, as it has, a superiority in flesh over the French, Belgian, Italian, Spanish and Hungarian, by reason of its richness and flavor; and although large quantities are imported, the former generally maintains the best value in the market, as well as the most ready sale.

Of the Goose at least two varieties are with us historical: the White and the Gray. These are well supplemented by the African, the Canadian, the Chinese and the Sebastopol, the last being the most ornamental. All are hardy, easily reared, and in every way profitable both to farmer and poultryman, and it is to a degree surprising that they are not kept in far greater numbers than they are, more especially about our commons and other waste lands. To this the almost general answer is, that it does not pay as it might on account of the foxes, the wearisome nightly housing of the flocks, where practicable, not being sufficient, for even with this precaution many are carried off in the broad day, and such casualties are so numerous that in far too many places well adapted for the feeding and maintaining large flocks of geese the attempt to keep them has for this reason been entirely abandoned. And so it is with other varieties of our poultry; a greater number both of fowls and ducks would be raised were it

not for the same cause, one man telling me that in two years he lost nearly one hundred pounds in value of poultry, and dare not ask for such compensation as, being high-class breeds, they were worth. Another fancier writes that he has lost just the last few of his Game-fowl hens by foxes. These can never be replaced, the strain with sixty years' pedigree being now practically extinct. A friend of mine lost fourteen of his best White Aylesbury Ducks in one night; on mentioning the fact to the master of the foxhounds, the owner was told he ought to have taken more care of them and got them in.

This is by no means an isolated case, and the constant worry, trouble and anxiety of collecting the stock at night in all weathers is by "The Hunt" never thought of nor cared for, and, unless in the case of actual loss, much less paid for, and that not always even in the latter case. Thus so it is that far fewer poultry is kept than might or could be, both for amusement and profit, while the nation has to largely import fowls, turkeys, geese, ducks, and eggs, by reason of this survival in civilized times of the



Photograph by Thos. Heap, Sowerby

GROUP OF PRIZE GEESE. (The property of F. G. S. Rawson, Esq., Thorpe, Yorkshire.)

"sport" of hunting animals, kept at the expense, and with perpetual worry and anxiety, of a certain inoffensive class of the industrial community.

I cannot forbear giving the above facts, for the reason that not only have I been a sufferer on one occasion, but that the complaints of loss from time to time have been so numerous that the wonderment is that the people, especially the poorer classes, have borne the scourge and suffered meekly and patiently the gross injustice so long.

As well as Geese, Ducks may be kept to great advantage, the White Aylesbury being the best for the market, the Rouen following close, while the somewhat newcomer, the Pekin, gains in the estimation of the "duckers" as it is improved in shape; but even yet there is a large appreciable difference in favor of the Aylesbury, which is also, if not quite, as prolific a layer, while the Pekin is the prime favorite in America, where some "duckers" raise as many as fifty or sixty thousand ducklings in a season, and this exclusive of a considerable number of eggs, that are turned to profitable account in various ways.

In conclusion, it may be observed that the dead (dressed) poultry shows will prove of much service in educating the public to the knowledge of what is really a good Turkey, Goose, Fowl, or Duck, and that of the highest quality. At present they are simply ignorant so far, and buy a fowl because it is one, and not so much on account of its superiority and excellence. Until this training has taken effect, the big-boned, coarse-fleshed, thick-skinned monstrosities that now do duty for "delicacies" will have a marketable value, and the cross-breeds and mongrels, advocated by interested poulterers and poultry dealers, will keep "in evidence." The horse-breeder, the cattle-breeder, the sheep-breeder, the swine-breeder, the dog-breeder, one and all know the enormous value of purity of breed, and this is clearly demonstrated by the high prices realized for such stock; but then with these there are no faddist lecturers, busybodies and interested poultry dealers, the last who realize most with mongrel stock cheaply raised and dearly sold. These, and such as these, have mainly contributed toward the gradual extinction that is going on of the best, the handsomest and the purest races of our poultry. Of this I am quite certain, and this from a long life's experience, that whatever animals or birds are kept, the best, the handsomest and the purest breed are not only the cheapest, but in the end will be found the most gratifying as stock, and far the most enjoyable and profitable in every way.

HEN AND THREE CHICKS

THE BEGINNING

"All difficulties are but easy when they are known."—*Measure for Measure.*

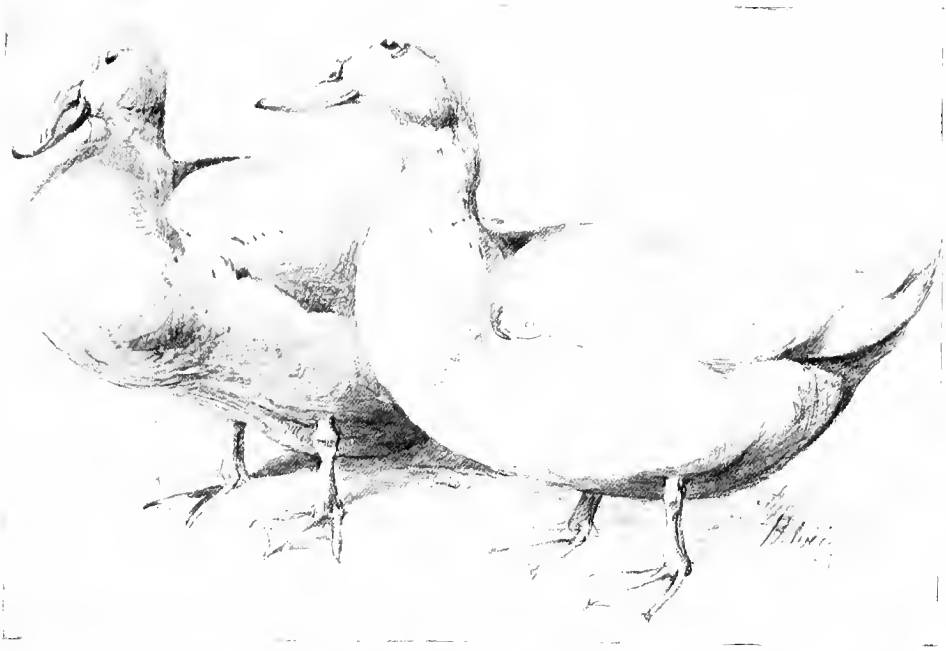
MOST people have the idea that for poultry keeping, whether for pleasure or profit, very little, if anything, is required beyond common sense, inclination and a sufficient amount of capital, as though there was nothing to learn, no knowledge or experience necessary, but simply to take or buy some ground, build sheds, make runs, and stock them with fowls, turkeys, geese and ducks, and—"the thing is done." But unfortunately it is not; excepting so far, that a certain amount of money has been spent in the hiring or buying of the land and "the poultry," a doubtful responsibility has been incurred, while the profit is by no means so apparent; and then the tyro begins to realize, if he or she has not done so before, that the keeping of poultry, like any other business, must have an especial training, and also an aptitude for the occupation, which may be safely said is not universal. This latter attribute is one that can never be acquired, and therefore it is possibly one of the reasons, if not the chief, of the many failures of attempted "poultry farming," even as an important adjunct to the land industry of the making of money in other ways.

These facts are already so well known, and have been so often and so

thoroughly discussed, that it seems almost superfluous to mention them again; and it is only for the reason that they are so continually disregarded, put aside, or disbelieved, that it is needful, and more than needful, indeed, it is imperative once more to call attention to the uselessness of, without some practical insight into the business, trying to do that for which they are thus unfitted regardless of, and utterly neglecting, the ever-increasing warning daily given by other absolute failures.

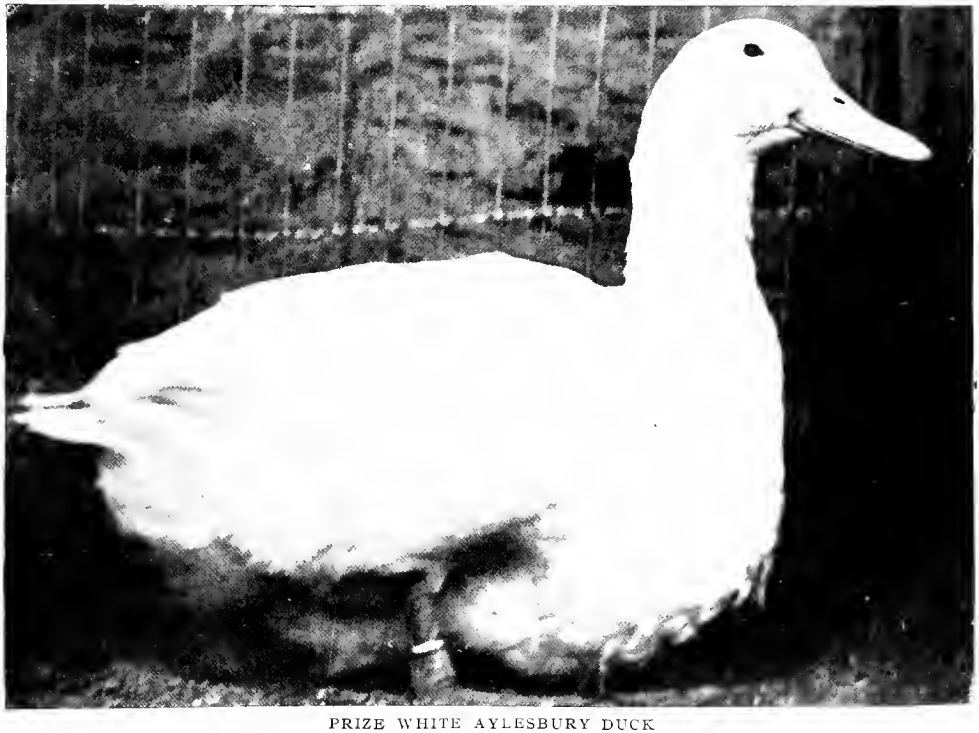
In the first place, if the keeping of poultry is decided upon, either for pleasure or profit, or both, the very best plan is to begin in a small way with a few fowls, as all knowledge is gained by observation, reflection and experience; then to add to the stock, if it is found to be a paying investment as well as a source of pleasure. Another way is that, but it cannot be so strongly recommended, of joining one already versed in the many methods, market values and other requirements. Various things besides inclination and capital have to be considered; and not any, unless they have tried it, can possibly conceive how many difficulties there are, expected and otherwise, and how much knowledge there is to acquire and the numberless things to learn before they or any can hope to accomplish even a moderate success. While, indeed, with some few all this is as though they were "to the manner born," and with such failure seems almost impossible, yet, even with such "gifts," there are other things necessary to command success besides the mere breeding and rearing of the poultry, and not the least of these are good, sound, steady business habits, an acute faculty for buying and selling, and lastly, a steady sale and market for the produce.

Before commencing, a locality must be chosen, and the soil should be dry, loamy, and slightly sandy, yet very fertile. The sand in wet weather prevents the mud adhering to the feet and feathers of the birds. The soil should naturally be well drained by a gravel or stony subsoil, and, if possible, have a clear stream intersecting, and toward which the ground should slope with a southern aspect. If sheltered by trees or evergreen enclosures from cold, raw winds, it is then indeed favorable; and where such can be secured, combined with a proper knowledge of poultry life, almost any variety of fowls may be kept with advantage. But if the land is heavy, clayey, or retentive of moisture, then it must be artificially drained, and also must be stocked with a more hardy variety of breed. In all cases where the ground to be occupied is bare it is advisable to plant



WHITE AYLESBURY DUCKS

11 months old, 10½ lbs. The property of Capt. Hornby, of Knowsley Cottage, 1852. These were selected as typical Aylesburys for the "Poultry Book" of 1853. They had pink bills, pink shanks and feet.



PRIZE WHITE AYLESBURY DUCK

The property of Mr. John Gillies, Chermeside, Berwickshire.

good varieties of fruit-trees, and of these the cherry is the most rapid-growing. Plums are especially suitable, as it is claimed the poultry keep down the ravages of the curculio. Where the yards are extensive, fruit-trees as variety should be the rule. This is the time-honored custom and a good one, the orchards being for most reasons the favored spot. Plant trees of vigorous growth—the kinds that are favorites in market. The trees will in time provide the semishade so desirable.

As to the houses, coops and rearers, they should be cheap and serviceable, fairly roomy, window-lighted, and well ventilated, but without a draught. Each should have perches, nest-boxes and dusting places, with scratching-sheds where no trees are available. The shape, height, width and size of the houses should be such as are suitable to the breeds kept. For the heavy Asiatic breeds a different kind of house must be provided, for Plymouth Rocks and Wyandottes and the Games or Hamburgs will require still smaller accommodations. The size of the runs must be determined according to space at command and the variety of breed for which they are intended. The run's fencing must be boarded, or have very fine mesh of strong wire, from the ground upward at least three feet high, so as to prevent the cocks from fighting. This is to be surmounted by two-inch mesh wire netting, at least six feet high with the flying breeds, and two or three feet with the Asiatics.

In most respects glazed earthenware or iron troughs for water are to be preferred to close fountains, for the reason that the latter are too often neglected, and not cleansed and refilled every day. Food-troughs should be used in small runs, the ground getting foul, and therefore clean troughs are best. In "the open" ground the grain, etc., may be scattered, changing the spot every day. A suitable building should be erected to keep food and all necessary accessories when not in actual use, etc.

The perches in the houses must be round and about two inches in diameter, so that the fowl can grip them with the foot, firmly and yet easily. Flat perches distort the outer toes, and in some instances cause lameness. It is a mistake to suppose a flat perch prevents crooked breasts, which are caused from a want of lime in the bones, and is constitutional. The leading poultry men of the United States use *flat* perches, and consider round perches in a marked degree the cause of crooked breasts. If the fowls run unconfined, it is well to have a dusting-house, and also a nesting-

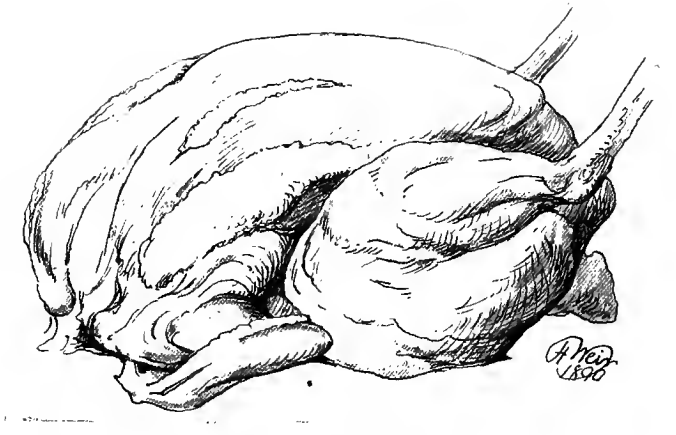
or laying-house, or houses with baskets and boxes properly fitted inside with several small closable entrances. This is preferable to having them in the roosting-house.

All the roosting-houses should have either open-wire, paled or latticed doors during the summer to allow of thorough ventilation; the usual close-boarded ones should, however, be used in the winter.

LIGHT BRAHMA HEN
Owned by W. R. Long, Illinois.
From a photograph by courtesy of "Commercial Poultry."

SILVER-BLACK LACED POLISH FOWLS.

The property of the late Mr. Joseph Partington. *Winners of many prizes.*



OLD ENGLISH GAME COCKEREL
Dressed Poultry Show, Agricultural Hall, December 22, 1899. Showing the fine form and fully-fatted breast. A superb fowl.

THE VARIETIES TO KEEP

GEORGE O. BROWN, MARYLAND

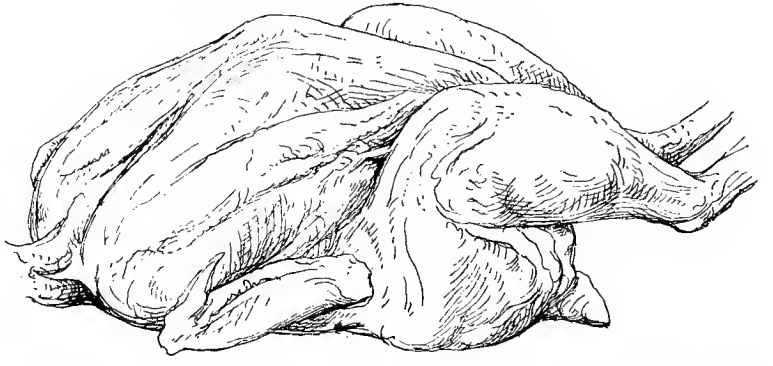
"I would we were all of one mind, and that one mind good."—*Cymbeline.*

WHAT variety of poultry to keep depends very much on locality, whether for table or egg purposes, whether for fancy or commerce, or both; a wide range over grass or in confined spaces, for size or quality of flesh, beauty only or utility, or these combined; whether they should be but layers and non-sitters, or whether an "all-round" fowl is desired—that is, one fairly good for the table and reliable for a reasonable quantity of eggs in winter as well as in summer. All these requirements must have careful, grave and deep consideration before purchasing the varieties ultimately selected as in all ways to be the most suitable.

For table purposes probably the best general-purpose breeds are Barred Plymouth Rocks and White Wyandottes. At almost any age, where the flock has been properly cared for, these varieties are in excellent table condition. Their plump shape, well-rounded breasts, broad backs and well-developed thighs make a most desirable combination, and cause them to present an appearance, when dressed, that is inviting and is a great selling factor. The Houdan, a French breed, is also an excellent table fowl. It possesses an abundance of breast meat which is juicy and tender; is small

of bone. Its chief objection is that it is not yellow-skinned. The Créve Cœur, and La Fléche, also French, are good table fowls. The Houdan, however, is the favorite in the United States, as it is much hardier.

The Langshans and Light Brahmas are the best of the Asiatics for table purposes. The first-named lacks the yellow skin that is so popular in dressed fowls. Orpingtons and Rhode Island Reds, which resemble each



FOUR-MONTHS'-OLD CROSS-BRED DORKING AND OLD ENGLISH GAME COCKEREL
Exceedingly good breast, quality fine, very thin skin.

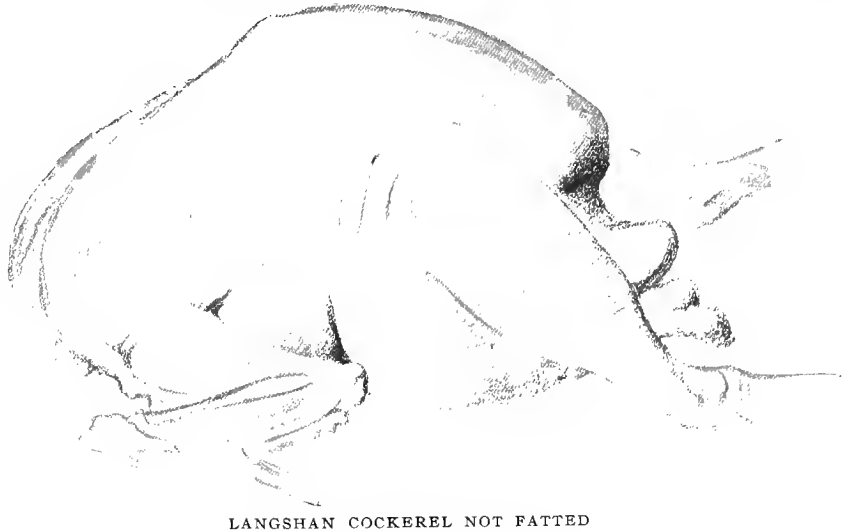
other very much in shape, are being "boomed" as wonderful table fowls and "general purposers."

"As regards the Black Orpington, a clear-shanked Langshan is better, and always has been. This last may be kept with great advantage, and I prefer it to that with the feathered shanks." The above, under quotation marks, is an English opinion. In the United States a "clean-shanked" Langshan would not be tolerated. It would be disqualified for the show-room, and would be classed as a mongrel on account of absence of breed requirements.

Besides these, there is that vastly overrated novelty, the "Cornish Indian." As a utility fowl it is no favorite of mine. It has been boomed to the very utmost, and by some thoughtlessly and recklessly so, and assertions made that were scarcely facts. If all that has been said of it were true, it would be perfection. It has been said that, crossed with the Dorking, it improves that breed; but it is the other way about—the latter improves the former. The flesh of the Cornish Indian is dry eating, and, when served as cold fowl, hard. The breast is always lean, the meat short-grained, the skin thin, and, including all the fat, mostly yellow, which last

accumulates quickly about the abdomen, back and internally, while the birds as shown dead and plucked vary very much in form, size and color, being from buff to a bright orange, this tending to lower its value as a high-class market fowl, and not so readily realizing a profit. As layers they cannot be commended, while as chickens they are slow of growth and require time to ripen. They are large and heavy in bone commensurate with their size.

The late Mr. George Brooke, one of, if not the largest, poultry salesmen in Leadenhall Market, London, a past master of the Poulters' Company, and one whose opinion was of real value, being, as it was, unbiassed, said that the booming of the Cornish Indian as a table fowl and good for a Dorking cross was unwise, and disastrous to the salable and the better qualities of our older breeds, and had hardened the flesh and totally ruined the time-honored whiteness of breast-meat, fat and skin which so long

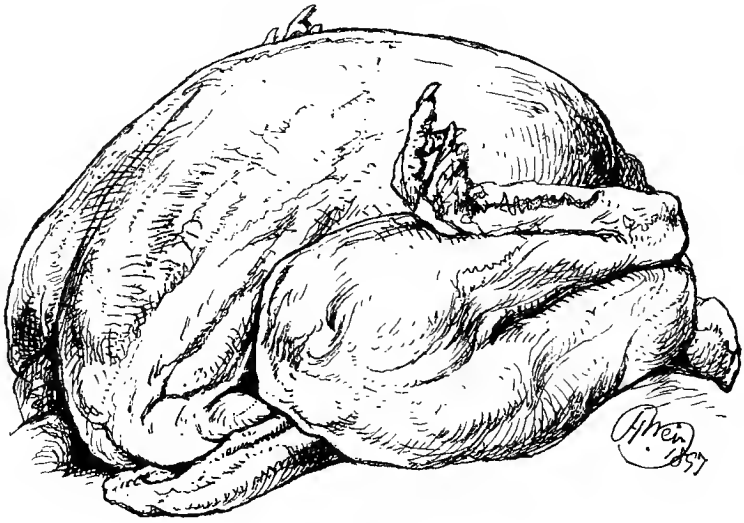


LANGSHAN COCKEREL NOT FATTED
Author's—bred from Miss Croad's.

and worthily held such a high position and prestige as the *par excellence* boiling fowl, the more-than-gold stain rendering them unsalable as such. "Look," said he, pointing to some rows of dressed poultry on and about adjoining stalls, "there is not a good 'boiler' amongst them"; and he was perfectly right. We heedlessly spoil our own, and then cry out for the better class and more salable French breeds. We shall never learn wisdom while every mouth is open ready to swallow the wild talk of the commercially interested few, instead of listening to the calmer and often more

thoughtful experience of the many. Fifty or sixty years ago such fowls as the Cornish Indian would have found no room in our southern homesteads; it would not have been tolerated among those of the magnificent breed of many generations. Then, if these are progressive times, why should it be so to-day?

As to the breeds when the eggs are to be the source of profit or requirement, the Langshan still stands first for beauty and quantity; then the Brahmas. Dark and Lights have many friends, being highly egg-productive



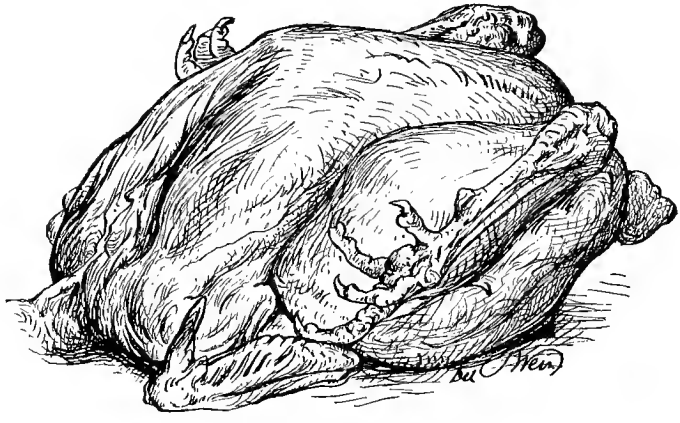
LANGSHAN
Agricultural Hall, 1897, Miss Croad's second prize.

though in a lesser degree than the Langshan, and this is chiefly owing to their unwieldly size and ridiculous over-feathering of the thighs, legs, shank and feet, these being often clothed with large falcon hocks. The American type is far the best—more useful as a fowl and more productive, and some have had a record of more than three hundred eggs in the year. If kept, the old style of Brahma is far the best both for early growth, flesh and general market value.

The reputation of the Plymouth Rock is good in all colors, but the barred variety for the farm and market has the preference, these coming to maturity early.

For white eggs in number the Mediterranean breeds are preeminent, both for size and purity of shell color, though the fowls themselves are but

dry eating, even if fatted. Of the best and first favorite is the Black Minorca, next the White Leghorn, then those of color. The Whites lay a little larger egg than the other Leghorns, and they are generally kept on the large egg farms. All are principally summer layers, and at such season amply fill the egg-basket; they are also considered profitable to keep. The common Italian fowl, the black and white spangled of which is known as the Ancona in the United States, are mostly prolific egg-layers, while all the varieties of Hamburgs I have found equally good; though the eggs are small, still the weight is made up by quantity, and thus have proved in a way profitable. The old white-faced Black Spanish fowl was at one time a good table fowl and a prolific layer, and might be again if rightly selected and managed, and so also the beautiful old Polish, formerly called the Hamburgh. All these latter are non-incubators, which is a great advantage when the space for keeping is but limited. I hope again to see the Black Spanish in the ascendant.

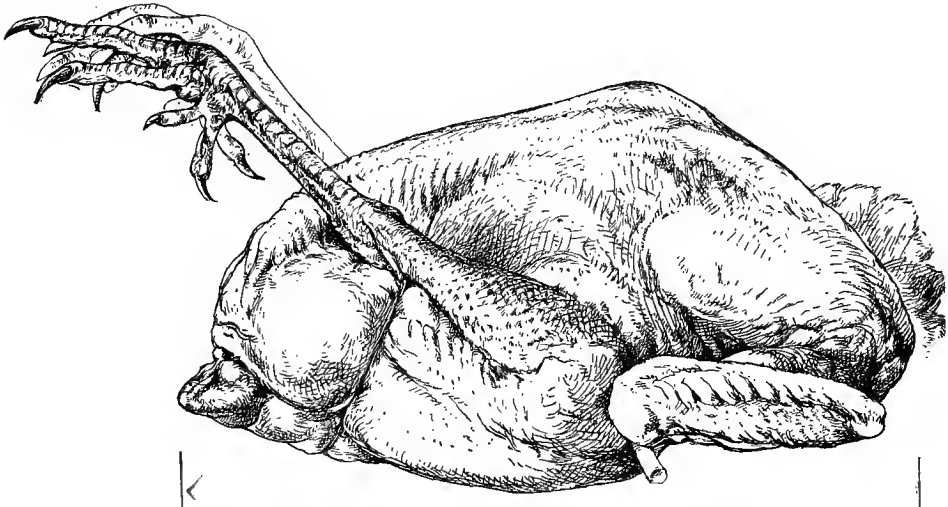


OLD ENGLISH GAME PULLET
Bred by the author. Second prize at the Dairy Show.

Good laying strains of most fowls may be made or ruined entirely by want of attention, proper supervision and management, the best and most prolific pullets or hens only being kept and hindered from sitting, and these mated with cockerels or cocks bred from hens unusually egg productive. As proof, Mrs. Campbell, of Uley, Gloucestershire, established a strain of non-incubating Dark Brahmas, their average lay being 170 eggs per annum. Mr. George Roper, of Woking, has done the same by his old English Game, and in this direction I have met with similar success, some of my old English Game hens seldom, and others never, wanting to sit, or, if so, easily put off.

The sum total of it all is, that whatever breeds are selected, have the best and the truest bred. The first cost is little more, yet for the extra

expenditure there is the gain not only of the contemplation of the beautiful, but the inward satisfaction that, should you wish to change what you have, such can easily be effected, for a good thing will command a price, while the low and inferior will not find even common acceptance, but utter rejection.

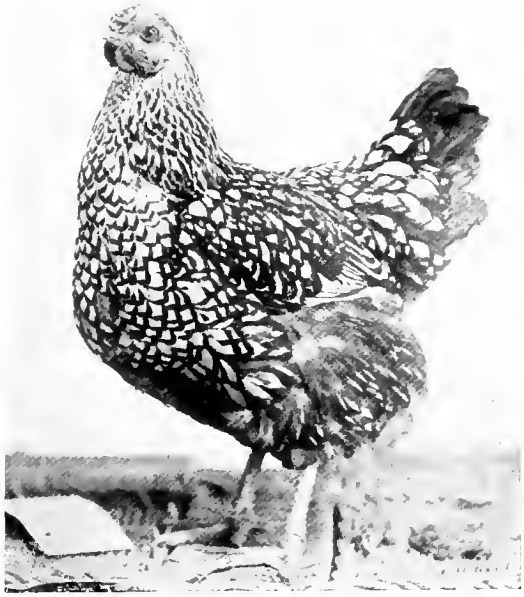


MISS GUBBINGS' DORKING AND PLYMOUTH ROCK PULLET

Buy from those well known, those respected not only for the excellence of their stock but also for their tried integrity and upright dealing, and bear in mind that few sell their best birds excepting at large and almost retaining prices; so if you wish at the start to be anywhere near perfection, you must be prepared to pay for it. The most economical plan is either to buy eggs at a good price from a reliable source, or to purchase culls that have some minor defect (not disqualification), and others that are without or deficient in those points which one or the other has in excess. I have thus bred, and known others to breed, better stock this way than by the mating of those possessing a great number of points of excellence, provided always the strain of which they came was old, well cared for, and of noted reputation. It is often, too, erroneously said that like begets like. Were this so, variety would be non-existent; and one has but to look around to at once prove the fallacy of the assertion. What it takes a genius to make, a fool may easily destroy. The one by piecing builds up and rectifies, the other by want of knowledge only weakens and spoils. Therefore buy where the best is kept, and, if possible, pedigree bred, and in all times prospering.

Cross-Breeds

I do not advise such to be kept, either for fancy or profit, feeling sure, from long experience, that pure breeds by careful management and mating are much more reliable and trustworthy, and far nearer perfection for any kind of fowl either for show or utility; also, they are more valuable at all times and seasons than mongrels or cross-breeds, young or old, the latter being of no value when past their prime, while the true and pure of any high-class strain will command a certain price, even at that age when their creative powers are weakened and their eggs few and late.



FIRST PRIZE SILVER WYANDOTTE HEN

Reproduced by courtesy of "Commercial Poultry," Chicago.

FIRST PLYMOUTH ROCK IMPORTED INTO ENGLAND BY MR. JAMES LONG

Photograph by C. Reid, Wishaw, N. J.
BLACK-BREASTED BROWN LEGHORN COCK

MATING AND BREEDING

I. K. Felch, Massachusetts

"Look here upon this picture, and on this;
The counterfeit presentment of two brothers."—*Hamlet.*

IN THE discussion of this important subject I quote Mr. Weir's own words in the first few pages and then begin my comments: As to the mating, the youth, age, purity of race, influence of sex, and the times, seasons and duration of strong, healthy fertility, as well as the stain of impregnation (if any), much may be said, and also how far the blending of the blood, habits, form and constitution of either or both parents is to be found in the offspring, apparent or otherwise, perhaps lying dormant, in some cases, for one or more generations, and afterward unexpectedly appearing, as is shown by several instances on record.

Although few subjects connected with our poultry have received so much attention, none are so little understood as the matching, breeding, cross-breeding and pure breeding of the different races of fowls. One man will strengthen and perfect a strain or breed, while another will completely ruin the good one that he has by wrong selection, treatment and

matching, yet more frequently by the introduction from another stock, though of the same variety, and for what he calls gaining vigor by adding fresh blood, when stamina is more surely arrived at by mating the finest, the most healthy, the strongest, the most matured, with the best constitution of either sex, and he must also match for age and other differences. If certain qualities are to be sought for or retained, the cock must be the youngest; if others, the hens or pullet hens—that is, those of the second year; but in all cases the birds must be well grown, hearty, strong, of proper form, well shaped in limbs, lusty, true to their breed, and of the highest quality both of flesh and feathering.

If large, well-plumed birds are required, then none of the hens should exceed three years in age. Of course there are, and sometimes must be, exceptions to this rule, but if either is to be the older, let it be the hen, a second-year cock or stag generally being at his best, and youth to youth was and should be the general and most approved practice. In choosing either, let it be from your own yard and of those you have kept pure—without crossing-out with any, though of the same breed or race that yours is made of. What will strongly conduce to the vigor of your stock is the sending away eggs to a distant part of the country, and having the chickens entirely reared into full growth on other soil different from that of your runs or ranges. The plan of varying the locality acts better than any crossing to obtain stamina; but, for want of this, your cock or hen birds may be sent to a distant part to molt and regain their strength for the duties required of them in the spring. And again, the best for choice of stock are the well-grown March hatched, which has been so long and universally admitted as to be regarded among poultry tenders of farms and homesteads as a wise saying. If you cross-out with a bird from another stock of which you know but little, though it is apparently good, let it be with a hen and not a cockerel, for then if wrong the whole progeny can easily be eliminated; but if it is a cock, then all your stock is tainted. In the choice of the male bird, let him be, if anything, rather lighter made than your hens. Let both be round and full-breasted, and of true and right proportion relatively one to the other—one, if anything, having in excess what the other lacks; this is found to answer better than when all are of equal forms and dimensions. Each should be alert, active, full of life and energy, and absolutely free from any injury, either by the loss of or a twisted toe—such deformity once bred in is difficult to eradicate.

Experience has proved this, as is even color or loss of a nail, for reasons which will be presently shown.

Feeling sure, as I do from long and careful observation, that pure old breeds are the very best, if properly selected, for all purposes, these will be first treated of and that they are presumably of your own stock. I am certain that there is no greater fallacy, and nothing more detrimental to the well-being of our best poultry, than the modern untutored craze for crossing-out. No one who understands the true art of breeding and rearing would even advise, much less practise it.

If you wish to breed healthy and strong birds of any particular strain, never let the young cocks that you intend breeding from run with any hens or pullets until the time that you match up in November or December, according to the breed, and never let your hens or pullets run with any other breed, cock or cockerel, whether in or out of season. It is best to keep all the cocks and cockerels, hens and pullets, separated until they are wanted. A flock of hens may consist of twenty if they agree, but if one or more is objected to by the others she is best removed at once, otherwise she will be disfigured, maimed, or killed. If the hens are allowed to run with another variety of cock or cocks, they, for pure breeding, will become tainted, and the stain once there is never eradicated, and they are likely to throw back, as I have known in many instances, though the late Mr. B. P. Brent, a good authority, says in the *Cottage Gardener* that after a hen has been introduced to a cock for three weeks, her progeny will follow the breed of the cock. This is certainly not so, nor anything like it. If a pullet has received the attentions of a cock, and then is removed from him and placed with another, the produce is likely to be of a very mixed description; this is not always so, but in cases of a decided preference for the first, as some fowls not unfrequently exhibit. Out of several cases that have come to my knowledge and in practice, here is one: I had a dark buff-colored pullet; she was bred of old English Game for two generations, but there was one cross-out with a Dorking cock before that; with this exception, all her antecedents were old English Game. She ran awhile with my old Game cock, which was in color a black-breasted bright red, somewhat splashed with white. At the expiration of a week she was removed and put with a Golden Hamburg cock that had sported to having white shanks, feet and toe-nails. After being nearly three weeks with the Hamburg, eleven of her eggs were incubated, with the following sur-

prising result: There were four cockerels; three resembled the Game cock, with much white among the feathers, which were of a red-gold ground and laced and spangled with black like the Hamburg cock; three had single combs like the Game cock in shape and fineness, and one a rose-comb like the Hamburg; two had five toes, thus reverting to the Dorking cross more than two generations back in the hen. Two of the cockerels had white earlobes, one partly red, and the fourth entirely so. All had white shanks and feet. Of the pullets, all had blue shanks and feet with white toe-nails. In plumage they much resembled the Hamburg cock in color and markings, but all were more or less splashed with white, though not to the extent of the cockerels, but one was nearly white, and also showed a strong resemblance to the Game cock. All had white earlobes, thus showing the chicks had the racial and other distinctions of two fathers, which were noticed and remarked not only by myself but all who saw them. At present I have reserved one cockerel; he is peculiarly handsome, resembling a Laced Golden Hamburg, yet having white in his wings; the shanks, feet, and toe-nails are very white. One pullet was a perfect Hamburg in color, with slight white markings, having a rose comb and bright blue shanks; others as described, some with four, others five toes. Here, it will be observed, is a curious mixture of natural forces, either of which could scarcely be supposed to exist, or, if so, were so long latent that it would be of advantage to know the limit, if any, of such endurance. Here is another case: Some ten years ago I received from a friend a spur-shanked partridge-colored Game hen. She was said to be of pure pedigree breed, and the stock from which she came had been bred most carefully for years. Mine were in-bred for many years, and were of the same color. After breeding from her with a cock of my own strain, I bred from her daughters, and again from their daughters, each time matched to stags of my strain, and all breeding true, until 1893, when two of the chickens hatched from the eggs of one of my best partridge hens proved to be almost black, with slightly gray breast. Knowing how my birds had been bred for thirty years, I concluded that the new departure was a "reversion" through the hen I had of my friend. On writing to him I learned that about twenty years before he mated a high-class Furness hen into his stock to deepen the color, and that was the only way that the color could be accounted for. Thus the cross had lain dormant more than twenty years, when it suddenly appeared in my yard; and not only that, but it still

Photograph by W. Scorer, Havant

MR. HERBERT REEVES' SILVER-GRAY DORKING

The winner of many prizes

Photograph by W. Scorer, Havant

MR. HERBERT REEVES' SILVER-GRAY DORKING COCKEREL

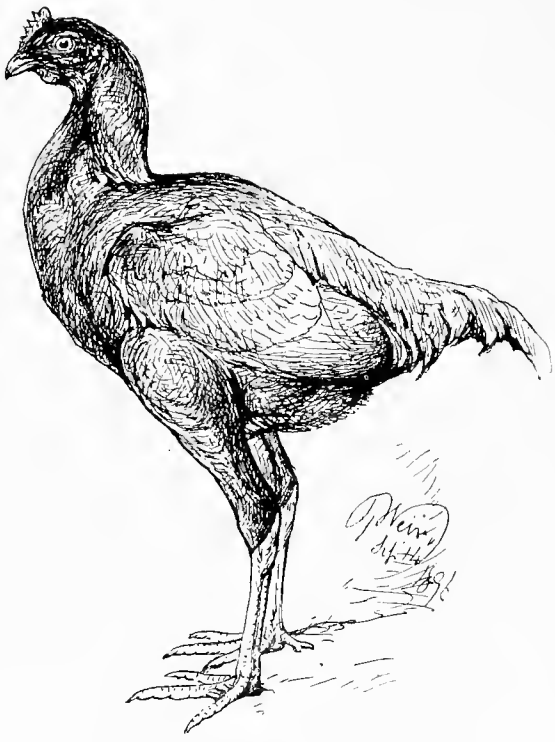
The winner of many prizes.

appears in two or three chickens every year. There was one dark pullet in the season 1899, and again more in 1900 and 1901; and this year, 1902,* I have had four dark pullets with brown shanks and feet. This atavism is yet apparent in the old breed of Derby Reds, which forty-five years ago had white or daw eyes, white in the wings and tail; and though during that time this has often been bred out, still after a generation or two it reappears, and it is a predominant factor in the composition of the time-honored old breed. Mr. John Harris, of Liskeard, writes very ably on this—what is called by the Game-cock breeders "bloodstain." He says: "Many breeders having a faulty or soft breed cock look out for an extra good one to cross with, thinking the first cross is 4-8 producer, which put to the sound bird 6-8 producer, again put to a sound bird and the said result is all 8; and they are supposed to be as good as they can be made. But it is a mistake; many will retain the former bad qualities, for, breed as you will, there is the taint left." By way of example: Fill a bottle with half ink and half water, then take out half of the liquid and fill again with water, then take out half the liquid left and once more fill with water, and so on until it looks clear; then taste it, and you will find a flavor of the ink still, and so is the blood of a true-bred Game if once mixed with the dunghill breed.

Theory is much, but practice is more, and experience is most. Rules may be made by which success should be achieved; lines of thought may converge and tend to the belief that from such and such conditions certain results must follow, and this simply from the reason that such is likely, and apparently more so than not, and yet instead of a prize there is drawn—a blank.

In Nature there are certain not yet understood hidden forces that are not only beyond human knowledge but also humanity's control. It is the "Why and the Wherefore" that we have yet to learn, even though they are deemed as the possible and probable, yet, being beyond our guidance, are truly not so. Nature's laws are not only inscrutable, but are, whatever may be urged to the contrary, abiding and unalterable. If we could fit things with an exactness that should show no deviation, whether we willed it or not, then we might be said to have gained a supreme power that at present, strive as we may, is simply unattainable.

*July, 1902—I have now bred from the same birds a purely black chick, comb, face, feathering, shanks and feet being that color, with white toe-nails. The skin is also dark.



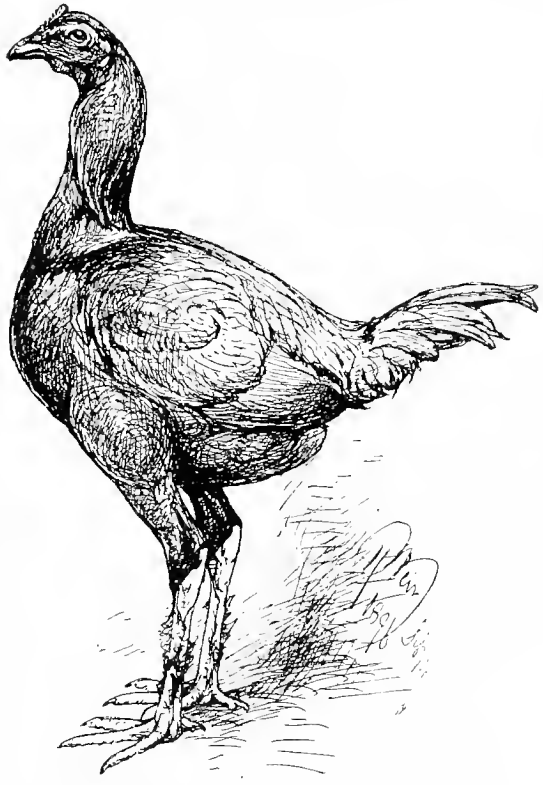
CROSS-BREED NO. 1, TWO MONTHS OLD

Here is a case: I have a dark gray old Kent five-toed hen. She is pure in color, being only of the two colors, black and white, with their variant gray. She is of the true type in make and habit, and lays a snow-white egg of the rounded shape peculiar to the breed. With her I mate a Dorking silver-gray stag. He, like the hen, has but the black, white and gray colors, is good in shape and shank properties, there being not a tint of any other color. From these I set a dozen eggs, out of which were hatched twelve dark gray chicks, which matured exactly as expected in point of coloring and form. Then another brood with the same result. Again another, and these, all but one, quite different from the parents and the former chickens, the whole number of pullets save one being stained with a yellowish tint or red on the breast and wings, the combs also being smaller and with less lap, while two had only four toes and one four and five. Looking at the two first families, and they besides the third, there would be no hesitation in saying that they were of a different strain, and most surely they appeared to be so. But why this difference? It was thought to be atavism on the part of the cock, the silver-gray Dorkings having been made by a cross with Lord Hill's white-shanked silver-gray Game and the old gray Kent and Sussex five-toed fowls. Yes; but why should all the two first broods be clear grays and black with white breasts in the pullets, and those of the third brood strongly different, save one? Why not all the broods? It was argued that possibly the hen, by laying, was weaker, and the stamina of the cock prevailed. This seemed feasible,

but then, to what period of time was the reversion confined? The cock was one of Mr. Herbert Reeves's silver-gray strain. But now comes a further surprise, if anything can surprise "the experienced." A fourth brood was hatched later, and every one of these (ten) were of the true first coloring; not a shade of anything else but black, white and gray. Of these, five were cockerels and five pullets, and two of the last are so true that they are a part of my gray breeding stock, and all much admired. I simply give the facts, and can offer no elucidation of the mystery. That was in 1901. The hen was again matched to the same cock, and thirteen eggs were put under a gray pullet, the result (January, 1902) being again dark and light gray chickens like the first hatchings.

Again, some of the pullets from the above pair lay a very, very slightly tinted egg, though those of the mother-hen are of the purest white. This shows that the blend from the cock's side still bears the taint of long-bygone crosses.

A few years ago, having some black-breasted old English Game with yellow shanks and feet, I gave a cockerel to a friend to cross in with a black-breasted brown-red Leghorn. At first cross the Leghorn had the best of it; next Leghorn cross, and the produce looked pure-bred Leghorn; but on breeding these together the old English Game blood reasserted itself to such an extent that in two generations the Game appearance far preponderated. This is by no means a solitary instance of where cross-breeding has been resorted to for the sake of giving stamina,

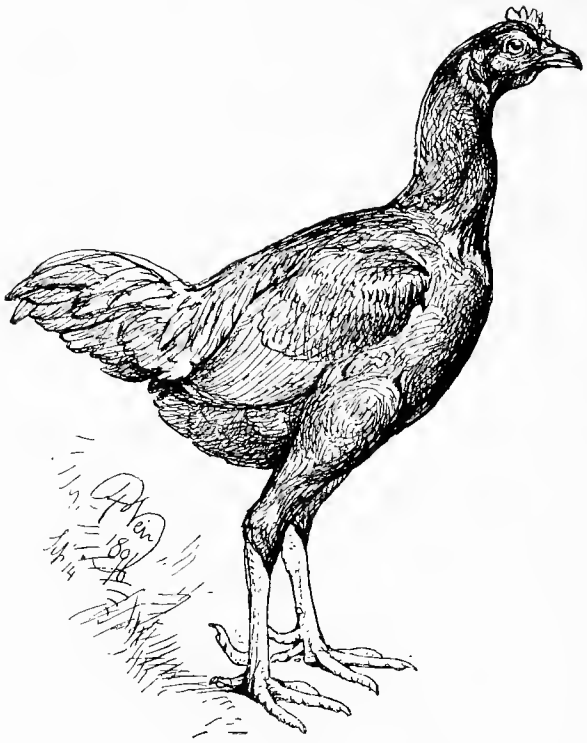


CROSS-BREED NO. 2, WITH FEATHERED LEGS

form or color, the preponderance of the older breed crushing, as it were, the weaker out of existence, as was the case with these so-called Black Orpingtons and the true Langshan cross, many of these coming with feathered shanks and Langshan form when least expected to do so, as also the Brahma and Shanghai cross not unfrequently shows itself in the modern Dorking.

Mr. Theodore Sternberg, writing in *The American Fancier*, March 31, 1894, tells of two hatches of chickens running in the same yard, one of Leghorns, hatched in May, the other Cochins, hatched in January. About the middle of September he sold all the Leghorns. All the chicks were raised together, Leghorns and Cochins. But to quote Mr. Theodore Sternberg: "Now I had several January-hatched Buff Cochin pullets, which began laying on the 25th of June. After the sale of these Leghorns none but Cochin cockerels were with the pullets. After my return from Chicago the pullets continued laying; the clutch laid nine eggs and wanted to sit. I set her on these nine eggs. Imagine my suprise, the pullet being set November 3d, at finding her hatch of seven chicks to be plainly a Leghorn cross. More than six weeks after the removal of the Leghorns the first egg of the setting was laid, and yet the cross was plain." In this case Mr. Theodore Sternberg apparently has failed to note whether the Cochin cock actually mated with the pullet, as it is just possible he did not; if that were so, it would go far to explain the mystery. I will give a case that occurred here: I had a black hen, a cross between a cock Cornish Indian and a Leghorn hen. She was very good in color, with a wonderful green sheen. She had been running with a black-breasted red Game cock that had white shanks, from which she was removed and put with a dark-colored Dorking cock; two days after she was placed with a spangled Hamburg cock. She was allowed to sit on nine eggs that she had laid after being put with the Dorking cockerel and the Hamburg. She hatched out seven chicks, two of which resembled the Game-cock in shape, and were nearly black in color, but had some white in the tail like that of the Game cock; both had whitish shanks, and one with a few feathers on the outer side, but none on the feet. I give an illustration of this bird, a cockerel. Two were Dorking-like pullets, with whitish shanks and feet with five toes; the feathers of both were black. I give a drawing of one of the pullets. The other three were black, with black shanks devoid of feathering, and had much of the Hamburg appearance; but what is

curious, two had white eyes, the iris being clear white or nearly so, similar to high-bred Azeels. I give a drawing of one of these pullets. Now it will be observed that these all came from a clutch of eggs that were laid by the black pullet after she left the Game cock, and were the nine eggs she laid before she wanted to sit. My opinion is, that if she had not been put to the Dorking for the two days, and then put with the Hamburg, it is just possible that she might have hatched out seven chicks all showing the Game cross; two of them clearly did, even to the white in the tail. Being a singular case, I made very careful studies of the chicks as shown. All were used for table purposes. Those like the Game cock were the best. The Dorkings were longer in body, but not so full-breasted, while in the Hamburg cross the flesh was rather dark, though good in quality and quantity. One of these laid an egg; it was white. But to return to Mr. Theodore Sternberg. He continues: "I know it is taught that ten days is sufficient to insure purity; but it was not so in this case. One other fact: this buff pullet had become broody after the removal of the Leghorn, and the eggs were laid after being broken up—an entirely different clutch of eggs." This might be thought so, but the sequel proves the contrary. There are cases on record where a hen has laid again after rearing a brood of chicks, and that without further contact with a cock, and the eggs have proved fertile, as was the case with one of the late Mr. Stamps' Game hens. No Game-cock breeder of the old school would ever consider a hen clean after she has laid while mated. Mr. Theodore Sternberg continues: "Such occurrences set us all thinking of the possible effect of the mingling of chicks of several varieties, and my experience may suggest how many sports can be accounted for. It may be that occasionally a hen can be found which if once exposed to a cross never again breeds true." Just so; this is too often overlooked, and there is but little doubt that a stain is left. Writing to Mr. Charles Darwin on this subject, I found he was very strong as to the continuation of blood stain, as it is called by some, as was also Mr. William Yarrell, V.P.F.Z.S., the author of "British Birds, Fishes, etc." Mr. Charles Darwin, in a letter to me, quoted a case that was known to both himself and Mr. William Yarrell, of a woman that had two children when the husband died. After awhile she married again, and became the mother of two more children. From an unexpected cause the husband became reduced in circumstances, and the relatives of the former husband, wishing to relieve the wife of some of her difficulties, agreed to educate, etc., the



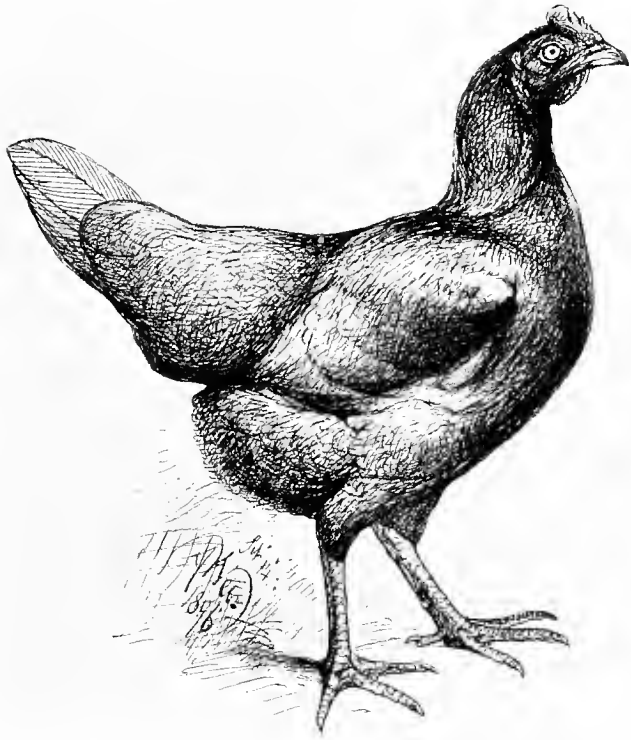
CROSS-BREED No. 3, ALL BLACK

two first offspring, but that on going to fetch them away from the house of the mother they saw the last two, and were so struck with the extraordinary likeness to their deceased brother that they provided for the four—that is to say, the entire number, the two children by the first husband and the two by the second.

As I have heretofore said, all the old Game-cock breeders would as soon think of putting one of their hens up as a stock hen, that had once run with a "craven" cock, as though she had run with a Dorking. In my opinion, a stain is never got rid of, even out of a carefully bred strain of fowls, much less one in the individual. After a very long experience and close observation, besides having had the advantage of a wide and varied knowledge and acquaintance with some of the best breeders, both of animals and birds, I have come to the conclusion that a stain will show itself after many generations, just the same as an hereditary disease will appear and disappear for many years, and then show again with renewed vigor. This may be noticed also in the contour of the face, which sometimes has a peculiar feature, and which an inspection of the family portrait gallery shows was in existence as part of the facial development of ancestors perhaps centuries before; and it must be borne in mind also that generally there has not been "in-and-in" alliances, but perfectly independent selections from various reasons, either natural or those influenced by real present or prospective benefit, of or for mutual or single interest.

However, one factor should not be entirely overlooked, and that is, that the family estates or property is generally inherited in direct descent by the male line; therefore, if there is anything in the assertion that the contour and general formation of the young partakes mostly of that of the male, while the female generally supplies the requisites necessary for the health and vigor of the offspring, so there is just a possibility that the male continues longer to stamp his individuality on the males as one of the peculiarities of the breed beyond the power of the female.

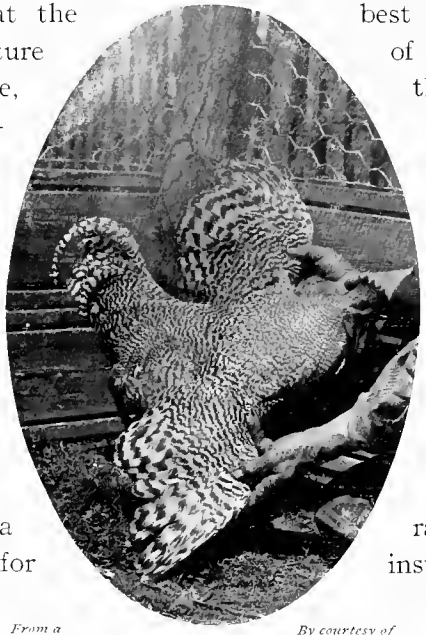
From what has already been advanced, as tending to show the extraordinary and mysterious working of natural forces, it is perfectly apparent



GAME AND LANGSHAN CORNISH INDIAN HEN
Pearl-eyed.

that too much care cannot be taken to preserve in its purity and integrity any particular breed or race of either domestic animals or birds. Mostly the breeding of our poultry is conducted, if at all, in a loose and unscientific

manner, with too few precautions taken to prevent an admixture of other variety, and so keep it free from degenerating contamination; while it is clearly overlooked that no real dependence can be placed on any but those of positively pure stock. And whereas in such, by critical choice of individual birds, proper food and seasonable mating, large size if wanted, early maturity and liberal produce, as surely to be depended on as the result, the haphazard adoption of the use of impure stock is at the best insecure, and must have before it a future of failure.



From a photograph *By courtesy of "Commercial Poultry"*

BARRED PLYMOUTH ROCK COCK, SHOWING MARKINGS OF WINGS

If a race is pure, that is, if the species is in no way tres- passed upon, and the variety is kept scrupulously in- tact and distinct, then and then only may it be expected that the progeny will resemble the progenitors in almost every respect, having, as it were, a continuity of form, color, general appear- ance and habits, for it is well known that even these are hered- itary.

If, however, a race is made up of mixed blood, as, for instance, the Plymouth Rock or the so- called Black Orpington, the product do not necessarily resem- ble their parents, and they often widely differ both among themselves and from their progenitors; and, indeed, so much so, that, were the extremes kept distinct and perpetuated, other new breeds might be the ultimate result. Then, again, it might be observed that some of the offspring of such cross-breeds bear little or no resemblance to their parents, which is the more so when they are the issue of old birds; while on the other hand it has been proved that, though there may be close breeding and consanguinity in pure breed, with proper and intelligent supervision and mating as to age, constitution and healthy robustness, their vigor is not only maintained, but by judicious management increased, which has been

fully demonstrated by the habitual in-breeding of the Game-cock—a race that for centuries has shown an indomitable valor, coupled with a mobile and lasting strength. A pure and ancient race may be "in-bred" with a degree of impunity, while it would be fatal to a cross-bred, which not infrequently become almost barren. Wild Nature in-breeds more or less, as is shown by certain animals or birds forming into groups, flocks or families; and these keep themselves as such intact by driving away all intruders, while the strength and vigor of the whole is kept up by the strong, for at least the time being the masters, in turn. Then again, the variation of locality is, in my belief, one of the necessities of natural selection, although birds drive or take away their young from the locality in which they are hatched. This is done so that by being reared and upgrown to adolescence on another soil and perhaps food, the actual constitution of the young is thereby varied and strengthened; and on returning to their native haunts they are often able to kill either one or the other of their parents (generally the male), and thus form an alliance with the remaining, if any; if not, then with themselves, as brothers and sisters.

American Views Expressed

There is such a difference between the English methods in the use of radical out-crosses or foreign crosses to revivify an old strain and the American system of preserving the thoroughbred, that in our case it is hard to reconcile the two methods. The English mode of introducing foreign blood, then breeding back but twice, is not followed here. Many American breeders believe that by mating two families of the same breed, and following line-breeding, the same vigor and prepotency can be obtained and far greater uniformity of shape and purity of color secured. In these days of advanced poultry culture it is an easy matter to secure paternal and maternal blood from strains of the same breed of sufficient strength and, I believe, better influence as new blood to strengthen the race. Two such, I believe, can be selected as an original pair to develop a new strain, while each strain thus mated may be preserved in all its vigor, prepotency, egg-production and beauty. The art of breeding and mating is to so mate that while we have the care to preserve shape and pure color we should not forget the productive merits. While we are careful not to admit foreign blood, we should be absolutely sure that our matings produced their chicks with blood of different proportions to the blood we are mating. To illus-

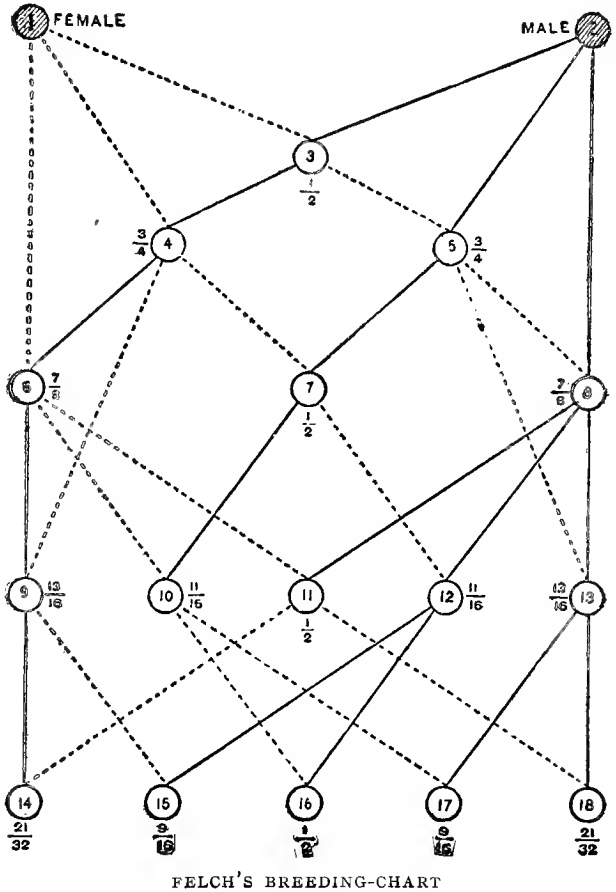
trate our system, I present my breeding-chart with explanations how the mating does present a different proportion, yet showing how we at any season can, without actual in-and-in breeding, produce half-bred groups from which to secure revivifying benefits for the two strains represented in our original or first mating. Coupled with this, we ever keep in mind that selection is the handmaid of line-breeding.

Health while breeding is essential for the hen. The most active with face and comb are good points. In fact, the hen in the best health at the time of laying will, no doubt, give us our best chickens. When we start with a pair the subsequent generations may be hens of 3-5, 8-12 or 15, as we can select of the type and color of the original dam. It may not matter how we produce the half-blood specimens, whether by out-cross, as in the English systems, or by the science of breeding, we are enabled to secure the half-bloods within one's own flock. I prefer the latter as seen in 3, 7, 11, 16, of my chart. The strength to our strain will be far more uniform in its effect than by following the English system. To illustrate, I had a White Wyandotte hen of prime color and shape that layed perfect, dark-shelled eggs, weighing 28 ounces per dozen. The second generation we used eight daughters, setting none but eggs that approximated the shape, size and color of the original dam. The third season thirty-six of her granddaughters of uniform color and shape and uniform dark-shell eggs were secured. Atavism comes in as strongly in this egg production as it does to control shape and color in the fowls themselves. But the male must be hatched from eggs of a kindred color or there will be a vast difference in the shade of color in the egg-product of his progeny.

You may fail to see the meaning of the solid and dotted lines of the chart. To make it clear, we say, each dotted line represents the female as having been selected from the upper group, while the solid line shows the male as having been taken from the indicated upper group. Each circle represents the progeny. To wit: female No. 1 mated with male No. 2 have produced group No. 3, which is ½ the blood of sire and dam. Females from group No. 3, mated back to their own sire No. 2, have produced group No. 5, which is ¾ of the blood of the sire, No. 2, and ¼ the blood of the dam, No. 1. A male from group No. 3, mated back to his own dam, No. 1, produces group No. 4, which is ¾ of the blood of the dam, No. 1, and ¼ the blood of the sire, No. 2.

Again we select a cockerel from group 5 and a pullet from group

4, or vice versa, which will produce group 7, which is mathematically half the blood of each of the original pair, No. 1 and No. 2. This is a second step toward producing a new strain. Females from No. 5 mated back to the original male, No. 2, produce group 8, that are 7/8 the blood of No. 2,



FELCH'S BREEDING-CHART

and a cockerel from No. 4, mated back to the original dam, No. 1, produces group No. 6 that is 7/8 the blood of the original dam and only 1/8 the blood of the original sire. Again we select a male from No. 8 and females from No. 6 and for a third time produce chicks (in group No. 11) that are half the blood of the original pair. This is the third step and the ninth mating in securing complete breeding of our new strain. In all this we have not broken the line of sires, for every one has come from a group in

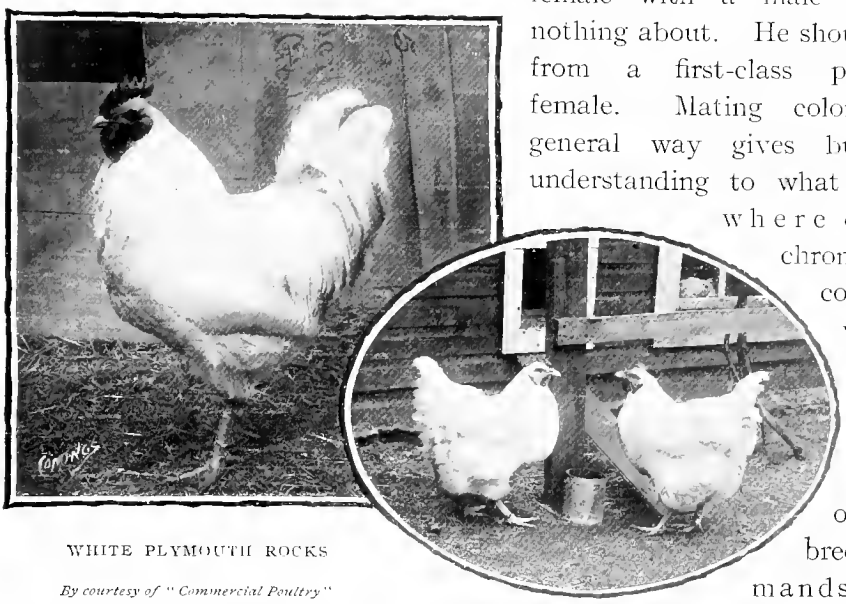
which the preponderance of blood was that of the original sire. Nos. 2, 8, 13 and 18 are virtually the blood of No. 2.

We have reached a point where we would establish a male line whose blood is virtually that of our original dam, and we now select from No. 6 a male which we mate with a female from No. 4 and produce group 9, which is 13-16 the blood of the original dam No. 1 and 3-16 the blood of the original sire. Again we select a male from No. 9 and a female of the new strain, No. 11, and produce group 14, which becomes 21-32 of the blood of the original dam, thus preserving her strain of blood. A male from No. 13, which is 13-16 the blood of the original sire No. 2, mated to females from No. 10, which are 5-16 the blood of the original sire, No. 2, gives us group 17, which is 9-16 the blood of said sire. While in No. 16 we have the new strain and in No. 18 the strain of our original sire, No. 2, we have three distinct strains, and by and with this systematic use we can go on breeding for all time to come. Remember that each dotted line is a female selection and each solid line the male selection.

In mating to secure a certain proportion of male blood in the chicks, we should at the same time make allowance for the same proportion of female blood. Thus: 5 mated to 8 gives 13-16 of the male breeding, and 4 mated to 6 gives 13-16 of the original strain, while the progeny produced by these two matings, 9 and 13, if they were mated for subsequent use, becomes one-half the blood of each of the original pair. The thing to ever keep in mind is that this middle mating, or all 3, 7, 11, 16, are the reservoirs of blood from which each of your two families are being fed, and whose influence is so strong for good that you will be enabled, so long as you are thus careful to live within your own yards, to produce unlimited numbers, and preserve the same likeness, vigor and productiveness you started with. Then how important is it that we in our first selection make sure that the female is a phenomenal producer both as to number, size and shape of her eggs, that she be of good size and as near standard shape and color as possible. Barring accidents, such should be our selection. Accidental deformity may not injure the breeding of a male, but often does that of the female; a perfectly formed egg being quite important in our estimation. One of the best season's get of young stock we ever had in Brahmas was from a cockerel that had a very crooked back and low hip on one side by accident. But had a pullet been so unfortunate it would in all probability have caused the eggs she layed to be ill-shaped.

Where accidents do not injure the perfect shape of the egg, no harm will come. Thus, when actual necessity demands it, we may use an injured fowl with profit, should it recover from such accident strong and in good health.

All breeders acknowledge that the male controls to a greater degree the shape and color; while constitution, size and productiveness is the special function of the dam. Yet I would hesitate to mate a first-class female with a male I knew nothing about. He should come from a first-class producing female. Mating color in a general way gives but little understanding to what it does where correctly chronicled in connection with special breeds. The mating of black breeds demands special conditions to secure specific results. The Langshans, for instance, present the finest conditions of black overlaid with a green sheen. Yet if two specimens possessing this phenomenal sheen are mated there is apt to come with it an objectionable bronze bar crossing the feathers. Nothing short of a deeply shaded walk will prevent it. Open run will destroy the purity. But a male with this high condition of sheen mated to females that are wanting in this respect, having dull shaded black breast, lower body and tail, will give chickens having little, if any, of this faulty barring. It would be folly to use a male of this dull black order. Breeders now look beyond the surface color. The second year's life of a first-class fowl is considered its best year for breeding. It is folly to breed from unsound color; the hen must have reached her second year in standard color or



WHITE PLYMOUTH ROCKS

By courtesy of "Commercial Poultry"

reasonably so; otherwise we must fall back upon the pullets of standard color, no matter what the breed.

As an instance of presumable in-breeding, Mr. Weir says that a few years ago two pairs of House Martins built nests under the eaves of his house. They were unfortunate, for in consequence of heavy rains one pair was not able to find insects for its young, which died in the nest, when the old birds departed, never to return; the other pair, hatching somewhat later, reared five young ones. All left in due course for other climes. Next spring the old birds returned with four others, apparently the young of the former year; the parents occupied their previous year's nest; the other two pairs built two nests, laid eggs, and hatched and reared their young, and then all left. One thing noticed was, that if any other Martins attempted to build near them, they were driven off by the entire strength of the colony. Next year more returned, and so on until the colony consisted of ten nests; and from careful observation of their habits, etc., he says, he has every reason to believe that the whole number of twenty were the direct descendants of the first pair, and yet were in full vigor and health, which I attribute to their six-months' (at least) change of climate, etc. I know from experience that change of locality has a great effect on Game-fowls; and that, though still maintaining their health and strength, they have lost their valor, and have become, for pit purposes, useless cravens. The Pigeon is another bird that breeds naturally in-and-in, each pair laying but two eggs, and the young are male and female, which afterward pair; and it is thought that whole flocks are thus blood relations.

Our wild birds generally flock the progeny of vast numbers before they migrate. Thus they have a wide chance to mate in a suitable manner. The strongest will be first mated. While this may be a special case of straight in-and-in breeding, I think it better not be applied as a rule for breeding fowls. Any hunter will tell you there is quite a difference in the size of birds of the same species shot from different flocks. To return to our poultry, Mr. Weir says: Where the variety or race is pure and true, it may and should be in-bred. If colonies of poultry can be established in different localities some distance apart, and cocks interchanged, there need be no fear of deterioration, and it is just possible that the whole strain may be perfected to any requirement by such an arrangement.

Such pure breeds are, in my opinion, the old five-toed Kent, Sussex and Surrey fowls, the old English Game, the Black Spanish as representing

the Mediterranean breeds, the Malay, the Azeel, the Polish, the Hamburgs, the Langshan, and some few others. Take any of these, make them into a strain, and they will breed like-and-like, and with due care each will develop to the full their particular attributes and qualities. But if any or either of them are crossed one with the other, or with any obscure mongrel, then continual annoyance and disappointment must be the inevitable result.

A most extraordinary case of impregnation is related by the late Mr. Richard Stamp, the celebrated Game-cock breeder, etc. He states that he had a Game hen that was taken away from the cock the day she laid her second egg, after which she was kept by herself. She laid nine eggs and then began "clucking," then sitting and hatching. She remained in the same place until her chickens were a fortnight old. No cock or any other poultry had been near her after laying her second egg. "I removed her and her chicken," says Mr. Richard Stamp, "to where there was no other variety of poultry, in a plantation walk; they remained there until she commenced to lay again, I not knowing, until she disappeared and commenced sitting. When I found her and her nest she had eleven eggs, and all seemed to have a bird in them. I thought she had mated to pheasants, but when the chickens were hatched they were all Game, and they grew up thorough Game. By this it would appear that the hen had thus carried over a certain amount of impregnation from the first sitting." He concludes by saying that he never had a similar experience with any other hen. Here I would observe that, in all my long and varied experience, nothing of the kind has ever come under my own immediate notice. On the contrary, I have found that when the cock has been removed from the hens six or seven weeks, any eggs afterward or then laid have generally proved infertile. Many old poultry breeders, however, aver that any time after three weeks will render them so; but to this shorter period I do not assent.

The above does not agree with my experience. I have found all incubating breeds that by taking the hen from the company of the male and isolating her I could never hatch an egg from her beyond the tenth. I do not think it possible for a hen to lay a fertile egg after having the incubating fever until she has been coupled with the male. I have even subjected a hen while having the fever to the services of the male, then broke her up. Not an egg was fertile until I put her with the male after

she had recovered from her wanting to set. I found the Leghorns would carry the impregnation a few days longer. But in all breeds where the females are changed from one harem to another, and when hens are removed from one pen to that of another cock's, the fourth egg will usually produce the progeny of the new male. I have never known this to fail. I see no other reason than that the new spermatozoa are more active, thus stronger, and overpower the older and weaker; and that the life of the spermatozoön in the oviduct is limited to about ten days, when the males are removed. The fact that chickens in extreme isolated cases in a five-toed race come with only four toes, and others with the fifth toe very small and short, cannot be taken as an indication of taint in blood, or the effect of atavism; for a low state of health causes this lack of full development of the Dorking race. Nor can the plea be raised in these days that a pullet having once mated with a male not of her breed has unfitted her for pure breeding afterward. That theory of Professor Agassiz has long been exploded even in mammals. To apply the rule to fowls falls to the ground. The thinking mind cannot accept the inference that pullets can thus be contaminated. Were it a fact, there would be exceedingly few pure strains in America to-day.

Speaking of improvement by crosses with other blood, Mr. Weir says: Of late years much has been said as to the making of new breeds, and when doing so there seems to be no dearth of assertion as to these mongrels possessing qualities far in excess of any of the well-tested and much-valued true old sorts. There is scarcely a property that they do not possess. But I think I may mention one they do not hold, namely,

THE INVALID

that of breeding like and like. Of course, we are told that they do; and some have gone so far as to say that they breed truer than the old in-bred or close-bred breeds. My answer is, buy a dozen, and let them be chosen in the same way as the old Kents were—simply for health, strength and quality, and after a few generations the variations will be abundantly clear. At least, this is my own and some of my friends' experience. They are not a breed, nor do they produce "like" with anything of the certainty as do those of ancient ancestry; neither is there, according to the mating to obtain them, generally a reasonable chance of their proving something "very superior."

Take as an instance the old Kent and Sussex five-toed fowls—fifty years ago said by all that knew of them or kept them to be the "best fowls in the world." They have been crossed with the Brahma, the Cochin and the Malay, all inferior fowls to themselves, and yet they are said to be improved. How can this be? Adding worse to good.

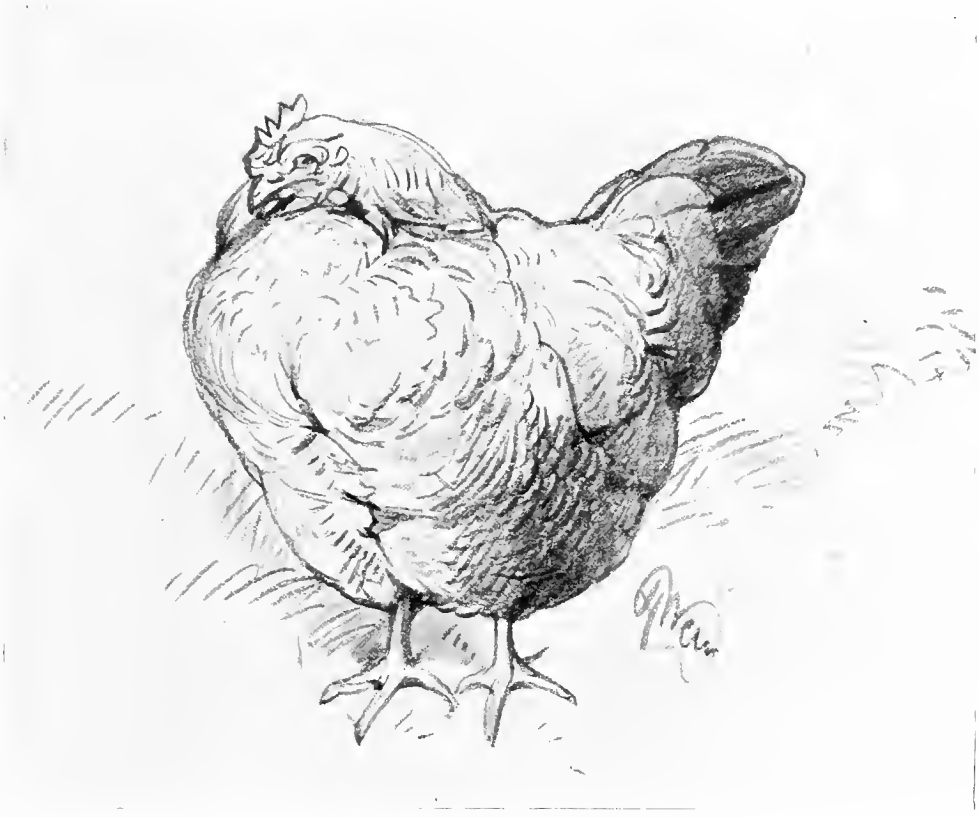
A mixture of blood is scarcely, if ever, a lasting success, but a certain pure cross for table or laying purposes may be and often is useful and profitable to a degree; but these never surpass an old and pure strain bred to the qualities required, and the less so in the mixed breeds, by the variety of form and color of individuals in the same breed.

Take as an example the old pure-bred, white-shanked, five-toed table fowls that in themselves possess all the attributes of a culinary breed of the very highest class. How is it to be improved, or in what way made better? It has been unwisely advised to cross it with the Cornish Indian. Where is the gain? The Cornish Indian, a cross itself, is a yellow-skinned, yellow-shanked fowl, and does not fatten on the breast like the former; the fiber of the flesh is short, close, and dry by comparison. Therefore you get a worse fowl, a yellow-skinned and yellow-fatted fowl, and one that makes more internal fat. You lose by this cross. Again, matched to a Cochin or Shanghai, the chick is bigger boned, less breast, and yellower, coarser flesh. Crossed with the Brahma, more bone, more offal, bigger in size, but with not so much breast meat, nor so good as the old pure breed, and in fact a worse result than from the mixture of the Cornish Indian. Even the wonderful grand-shaped Azeel hardens the flesh and spoils the fatting propensities of the first. As Mr. W. B. Tegetmeier rightly said, now nearly fifty years ago, that which was well-known long before then, "You cannot improve the Dorking." And that is true, for the sized bird; but if

a less is wanted, then an alliance with the old English white-shanked pit Game will leave nothing to be desired, both parents being of the highest class for table purposes. This is good matching, and the former wrong.

Before "matching" for a cross-breed, the first thing to be considered is, where will be the gain? If you have a perfect breed for its purpose you only injure instead of benefiting it by crossing, yet some varieties may be so treated with profit. For instance, a loose-feathered, breastless fowl, with large legs and thighs and generally feathered shanks, fattens very readily, mostly so about the neck, forepart of the breast and back. Then for this, an Azeel cock, with his highly, fully developed, close-grained, meaty breast would make a most desirable cross, if a new style of fowl is wished for; but the laying properties possessed by the former may be seriously damaged—you cannot have both flesh and eggs from the same bird. I am perfectly well aware that for commercial purposes the contrary has been asserted, and has been believed by the thoughtless and credulous, but never by the experienced, cultured and reflective mind. The old English white-shanked pit Game may be matched with advantage to the Cochin, the Langshan and the Brahma, if fowls with larger frames than ordinary for farmyard purposes are in demand; but here again there is no absolute gain, for if some of the progeny equal, none will surpass the old English farmstead five-toed breed pure and simple. In all cases of matching, then, bear in mind, whether it is the stock of the pure breeds or crossings, the full and persistent purpose should be to obtain birds at least as good as the parents, but better if possible. And very few mixtures of form, habit and breeds of poultry lend themselves to improve that which generations of the most carefully organized treatment has rendered certain breeds unsurpassed for whatever special purpose was considered attainable.

It must be borne in mind that the foregoing is from the English standpoint, where none but fowls with white or flesh-colored shanks and what is termed white skins are fully appreciated for poultry meat. To advocate such for the American market would be disastrous if followed by the American poultrymen, for the very reason that fowls with yellow shanks and skin are in absolute demand. We find here in the States that in all the competitions the progeny of the White Wyandotte male with Brahma females have won nearly all the first prizes. But when a little larger carcass was wanted the cross of Indian Game with the Brahma took the lead. For broiler purposes, fowls of one and one-half pounds to the pair



BACK FROM A FORAGE

dressed, the White Wyandotte stands at the head of the list, with the Indian cross next. The Brahma chick makes a broiler of four pounds to the pair in eight weeks, producing that weight four weeks earlier than will any of the American breeds, thus enabling the trader to produce in his plant 50 per cent. more pounds during the season. This practical side of poultry culture, it will be seen, is controlled solely by country and locality, in the consideration of which the breeder must use his individual judgment. When the breeder is to sacrifice the advantages of pure breeding for kitchen uses in both poultry and eggs, as in this case of the Wyandotte with Brahma, not only does he produce the best broilers or roasters, but a larger number of eggs per individual than the maternal ancestors, besides preserving in a wonderful manner the size, shape and color of the Brahma egg. This has had a good influence on Brahma eggs in the market in some places over other breeds. Thus, the reader sees, it is impossible to advocate one

rule to govern all countries in this respect. There is no doubt for egg-production alone the White Leghorn as a breed, or its male mated to Brahmas, will produce the largest number of eggs per capita, but the meat itself is of less value and excellence than those mentioned above. In these days, when the thoroughbred is so popular, we think it far better to use the pure breeds and sacrifice the lower half for kitchen uses. It will leave the other half of superior quality. At the late Boston exhibition, single males of the Buff Plymouth Rock breed sold for $300, and four females to make up the pen for $200. Sales in New York have been made within three years at $225; Light Brahma males $150; eight White Wyandottes at $500 and single males as high as $125 each; ten Partridge Cochins at $1,000; $500 refused for ten White Leghorns. With this array of facts it seems foolish for any breeder to indulge in cross breeding when he can reach all necessary points of excellence with the pure breeds at hand and still have a chance to reach results such as quoted above.

Effect of Food, Soil and Shade

It behooves the breeder to exert himself in every possible effort to furnish every condition that will secure a beautifully colored flock. Does the partridge ever lay her eggs above a stratum of frost, or does she lay in spring before the earth is warmed so that worms and insects come to the surface in her feeding haunts? Does she molt after the harvest is past? Does she seek the thick shades of the woods during the middle of the day and the open fields along the outskirts of the wood during the early morning hours? What lesson should we learn from this other than that meat, vegetables and grains in about the proportion of fifteen per cent. meat, twenty-five per cent. vegetables, and sixty per cent. grains should be the daily food of our flocks; that the chicks should be hatched with the early grass blades with tender food for them; that our flock should be furnished shade where they may retire in the heat of the day, especially during the molting season. When flocks secure their adult plumage after the middle of September in New England latitudes, they retain to the largest degree pure shades of their color. Let a Plymouth Rock cockerel secure his adult plumage in July and a brother in October. The former in January may be greatly tarnished, while the latter remains bluish-gray and preserves his prime color throughout the entire season. Soil and sun have, in my opinion, far more to do

with good or bad color than any other two things. The finest colored Partridge Cochins I ever saw were raised about an iron foundry, in a locality heavily charged with iron deposits. These conditions will affect in a like manner Golden Hamburgs, Golden Wyandottes, and all so-called buff breeds; while all Whites or Barred Plymouth Rocks would suffer greatly under such conditions, turning the Whites to a yellow shade and the Rocks to a bronzed discoloration or cause the bars to become quite black —all detrimental to their standard demand. The breeder of strictly thoroughbred fowls will do well to profit by the above lesson from nature. Give to all breeds ample shade and cool quarters in summer. They can stand dry cold weather better than severe heat; damp cold weather is a peculiar hardship for them.

For the game breeders, and those who are fascinated by the mixing of colors in animated nature, we give below Mr. Weir's own words: Color is much influenced by climate, food and locality, some places producing deeper or lighter tones of browns, grays, buffs, etc., though the birds may be fed in exactly the same way, with the exception of the herbage they find, the insects, and the soil which is taken into the system in the form of "grit." And also there are other causes, such as water, etc. A friend of mine sent me some young dark Dorkings, rich and pure in color, and white in shanks and feet. The next molt with me they showed much white in their plumage, while none of his own changed a feather to white; the third season of molting one hen became quite white. I gave her to a lady who resides in Sussex, where the soil was impregnated with iron. At her next change of feathers the hen became nearly her former dark rich color, with only a few white splashes. Nor is this the only case by many that has come under my observation. An old Game-fowl fancier, living in Cornwall, showed me a few years ago a flock of most beautiful black-breasted blood-reds. I have never seen better. He said that they were the stock of a deceased friend, and had been bred by him for many years in the state of perfection that I saw them. With the next molt nearly every one was more or less splashed or ticked with white, which became on his "walks" so persistent that he changed his breed.

I call attention to these few facts, and could give more, for the purpose of showing that it is not always food, but the particular soil, etc., on which the fowls range, that makes a considerable difference. It is so among our wild birds. The Red Grouse of the Yorkshire moors are brown beside

the Scotch, while all others that I have seen look dark by comparison with the bright reds of those on the island of Lewis. The late Sir Frederick Millbank some years ago sent me three brace to testify to the fact.

But apart from this district variation, there are rules for mating in the producing of certain tints, coloring and markings; and, as is daily proved by color photography, nearly all may be got by a combination of three: namely yellow, blue and red. Of these in "feather" breeding the yellow is a natural color, sometimes found on animals and birds in a wild state, as is the red and the blue, which last is the pallid of the black, with the white or albino also found under similar circumstances. These are merely differentiations from the normal color, and, therefore, by the fancier's art are capable of intermixture, thus producing such variations as he may consider beautiful or interesting. Thus you match a white cock with a black hen, and if the colors are solid, without a break of any other, the chances are in favor of the production of the blue. The white with the light buff will produce a primrose color, with the light red a nankeen, and if with normal that of a black-breasted red, sometimes a wheaten of light red in the hens, or it may be a black, for white and black are nearly the same in breeding color. An East Indian drake with our common white ducks will often produce blacks; and Mr. Henry Digby informed me that he got the larger-sized Cayuga ducks from a drake of the breed mated with the modern Aylesbury duck. The normal color is the strongest and most assertive, and black the next; while white is the most obtrusive, as showing a weakness or lacking of color-pigment, coming as it does in old birds, and yet from the young of these scarcely appearing as permanent until at least the second molt.

The yellow, light fawn, fawn, or what in natural color is called the Xanthus, are weak, and, applied to the normal, have the tendency to lighten yet with the nankeen giving a warmth of hue and tone that is in some particularly pleasing, while the light gray on blue cools and dulls, as may be observed in the blue-dun Game-cock (Kentucky blue), which illustrates a combination of the buff, light red and blue.

In natural or original coloring of the black-breasted red cock all the long, attenuated, sharply lanceolated feathers, such as the hackles, etc., are of the brilliant character, filled with a catching iridescent light that sparkles, comes, goes, and flashes in the sun; while those rounded, full and wide are invariably black, with the exception of the primary and secondary

on the wing, which are in shape different from the hackles, the breast or thigh plumage. This being so makes a division thus: black-breasted red, black-breasted gold, black-breasted yellows, silvers, grays, duns, etc.—smock, or white-breasted reds, golds, yellows, grays, duns and blacks; in each of these the spaces occupied by the colors are the same, the only variants being the hue given to each, and these may be intercrossed with ever-varying effects and beauty.

These would be to a degree on a par with the two-colored tulip, for before the other breaks this often ensues. As in breeding white and black are the same, so either mated with the primitive colors will produce either birds mottled with white, or darkened with black spots or lacings. The first is the true spangle, which should have a white tip to the feathers; and the second, though called spangles, is not rightfully so. The spangled Game is the self or original color, white tipped, similar to what was called speckles in the old five-toed fowls and other farmyard breeds.

A black cock allied to a partridge-colored hen will often produce the superbly brilliant feathering of the black-breasted black reds, but this is not always so. Birds of such chromatic shades are held in high esteem, and are said to be possessed of unusual stamina. All the others, such as turkey, starling, blotched, splashed and grizzle breasts, are the foul-feathered, not bred for varieties. The art in color-breeding is to keep each brilliant glowing and distinct, each in its defined and proper place, with the edge of contact short, clean and true.

Photograph by C. Reid, Wishaw, N. B.
COCHINS

Just a few more words as to the influence of the male bird in cross-fertilization. They are taken from "The North British Agriculturist," of April 19, 1883: "The experiment was that of Mr. Lewis P. Muirhead, Helensburgh, and was intended to indicate the

time, etc., that it would take to obliterate the characteristics of the female of another strain. The female chosen was one of two La Flèche hens with which the late Mr. Dring some years since won many prizes in England, the type of comb shaped like a pair of horns, white earlobes (these would be small), and white egg being strongly characteristic. The males were reared from eggs laid by hens imported from Langshan, north China, by the late Major Croad, of Worthington—upright serrated comb, black eyes, black-feathered legs, red earlobes, and pink-buff eyes, both breeds celebrated for their sheeny black plumage.

"*First Cross.*—Hen, Hamburg in type, rose comb, white earlobes, bare legs, amber iris to eye, egg white.

"*Second Cross.*—Hen, leggy and awkward looking, double comb, lobes white and patchy, amber of eye rather darker, egg cream color.

"*Third Cross.*—Hen, Langshan in appearance, comb waxy, eye darker, egg pale buff.

"*Fourth Cross.*—Hen, quite Langshan, full-bodied, pink-toed, feather-legged, dark-eyed, egg buff.

"*Fifth Cross.*—Hen, perfect Langshan, full-bodied, pink-toed, feather-legged, black-eyed, upright comb, red earlobes, egg pink-buff; the chicks were almost black in the first and second cross; light canary color, with the black velvet jacket of the Langshan in the last three.

"The gradual alteration of the color of the egg from the pure white of the La Flèche to the curiously characteristic pink-buff of the Langshan in five generations is worthy of note.

"What I am now coming to is the color of the shanks. The strongest color in many breeds, and the most difficult to out-breed the stain of, is the yellow. The blue is greened by it, and the white, as the pure soft-looking milky white, is sooted and ruined. A cross was some years ago made between a yellow-shanked Game-cock of wonderful color and two gold-spangled Hamburg hens to give more brilliancy to their golden ground, but failed entirely, for the reason that the yellow of the shanks could not be eliminated. It was so, and is so with what is universally termed Dorking improvement crosses. The mongrelism does show, and will show from generation to generation, and a lifetime will not get rid of it. It shows on the white shank and foot as horny in tint, then sooty more or less, and often when supposed to be bred out will, when put to a pure old strain, come out again in all its glory of pure yellow. I know this; I have seen it;

and many a good and pure strain of white-shanked birds, both Game and Dorking, has been ruined by the persistent actions of those ignorant of the probable results. It is far better, if a cross is necessary with or for a white-shanked strain, to make one with blue or slate than yellow. Yellow is the very worst of all; it stains and tints the whole body and system of the bird, while the first does not; both are difficult to breed out, but the yellow is the most persistent, and where firm white flesh, fat, skin and shanks are the points of excellence, it is grossly pernicious, and utterly to be avoided."

In the above statements of Mr. Weir it is understood that he continually refers to foreign or crosses out of the breeds named, but climate has a great influence. It has to be admitted that the yellow skin and scales do constantly appear in shanks of breeds described as otherwise. So prevalent is it in Langshans that the judges in our exhibitions first take a look at the bottom of the feet to see if the specimen is not disqualified for that cause. It seems to be the first and strongest ancestral control; and that soil and feed all tend to introduce this taint to all black- and white-shanked breeds. Notwithstanding atavism is so strong in nature, yet man can and does control in a wonderful degree by forcing the matings, and secures results gratifying to behold. The breeder who knows nothing of the ancestry of the fowls he mates may fail. But when our stock has been carefully bred for a succession of years it furnishes the keynote to all science in breeding. We can do no better than to search out the individual specimen possessing the traits we covet, breed them in line, thus intensifying their transmission in our flocks. It is thus only that we secure and raise types recognized as strains. It is the control of these ancestral influences by man's intelligence that gives us the results so infinitely better than we see in natural selection and the survival of the fittest. It is not strange that man works out these higher types of animals. Not even do our flocks escape the inspiration, and new breeds come to the surface.

"There is a history in all men's lives,
Figuring the nature of the times deceased;
The which observed, a man may prophesy,
With a near aim, of the main chance of things
As yet not come to life; which in their seeds
And weak beginnings lie treasured."—SHAKESPEARE.—2 HENRY IV.

BLACK-BREASTED BLACK RED GAME.

The Poultry Book

By
HARRISON WEIR, F.R.H.S.

American Edition Edited by
WILLIS GRANT JOHNSON
Assisted by
GEORGE O. BROWN
as Associate Editor
and
Many American Experts

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This book has been revised and partly rewritten from the American point of view by American experts.

CONTENTS OF PART II

"The Commercial Egg"
"Eggs from a General Point of View"
MILLER PURVIS, Illinois

EGGS FROM A COMMERCIAL AND GENERAL POINT OF VIEW

MILLER PURVIS, ILLINOIS

"Man shall rise at the crow of a cock."—*Jeremiah.*

EGGS no doubt have been an important article of diet from the earliest ages. The wild jungle-fowl of India (*Gallus bankiva*) was domesticated long before history begins, and the most ancient writings mention it. It is mentioned in the Institutes of Manu, and Babylonian cylinders have been found with the impressions of domesticated fowls on them. Ever since history began poultry has been mentioned by historians, and none of them has mentioned it as a newly acquired part of the established order of things.

It is probable that the Aryan invasion of Europe marks the beginning of poultry culture in the west, and since that time almost constant improvement has been made.

Even in the depths of Africa the first explorers were offered or were able to purchase in the rude market-places of that dark continent both eggs and poultry.

The Chinese and Japanese have been expert poultry breeders for many centuries, and the large-sized fowls and ducks of China and the long-tailed fowls of Japan are examples of the skill of these Oriental people in molding and shaping the fowls they breed to suit their fancy.

The Black Langshan and the Pekin duck are examples of the skill of the Chinese in this direction, and these breeds are to-day practically as they were when first imported from China.

Eggs have had a place in the religious observances of both pagan and Christian nations for centuries. The heathen offers them as an acceptable sacrifice to his gods, and the Christian makes them so much a part of his festival of Easter that the markets of the world feel the effect of the increased demand at that season.

The Christian festival of Easter is an old Pagan festival engrafted on the observances of the Christian Church. The early fathers found the

pagans of Europe celebrating a festival at the time of the vernal equinox in which eggs were used in quantities. It was not a violent change to transform this celebration of the return of spring into one in memory of the Resurrection. The egg was held as the symbol of the return to life of that which had died; the pagans celebrated the revival of vegetation, and the Christians changed this into a symbol of a new life for the soul of man.

It may be remarked in passing that there seems to be some connection between the religious observances of a people and the type of the poultry bred by that people. The Oriental uses fowls as sacrifices, and breeds his fowls to large size, as witness the Asiatic breeds. The Christian of Europe uses eggs in quantity at Eastertide, and his ancestors used them in his vernal festivities, and the fowls of Europe are noted for their prolificacy. The Malay delights in cock-fighting, and his fowls are the strongest and most fierce of all the family, fighting to the last gasp with indomitable courage.

The egg is a good example of how nature adapts itself to environment and conditions. Lay an egg on a plane surface and it revolves on its own axis, having a tendency to occupy the same place. This is on account of its peculiar shape, being pointed at one end and turning around without progressing. This pointed shape also serves to keep the larger end the highest when it lies in a bowl-shaped nest, a position that is necessary during the process of incubation, as the head of the embryo is always toward the larger end and needs to be kept higher than the remainder of its body.

The shape of eggs is also the one that is best calculated to resist attacks from without. The shell is composed of a very fragile material, and it is so shaped that it resists considerable pressure from without, yet at the same time is easily broken by the chick that, having arrived at the end of the period of incubation, must break its own way to the outer world.

Commercially, eggs have become an important factor in the business of the world. Millions of dollars are invested in the traffic in them, and immense buildings have been erected in which they are kept in cold storage from the season of greatest plenty to the season when they are scarcest. They are of great importance in the arts; and from furnishing the albumen with which photographic paper is coated, to being used in the making of fine leathers, hundreds of thousands of dozens are used.

Besides being held in cold storage from one season to another, they are prepared in various ways for export to far-off countries. Large fac-

tories are required to produce desiccated or dried eggs for the export trade, and thousands of dozens are canned, frozen, and thus transported to distant lands.

In many parts of the world there is a large trade in the eggs of wild fowls, and at one time egg-hunting on the Farallone Islands, off the coast of California, was quite an important industry. On the east coast of

Photograph by C. Reid, Wishaw, N. B

SILVER-SPANGLED HAMBURGS

Virginia the eggs of gulls are often eaten, and on the coast of Texas a few years ago there was a considerable trade in heron eggs.

As a rule, however, when we speak of eggs we mean hens' eggs, although the eggs of ducks are of considerable commercial importance, and those of geese and turkeys are quite often included as articles of diet—those of turkeys rarely, as they are considered too valuable for hatching to be eaten.

Eggs of the different breeds of fowls vary considerably in size. The egg of the diminutive bantam weighs about fourteen ounces to the dozen, while the eggs of the Langshan hen or the stately and aristocratic Minorca or Andalusian often weigh in excess of thirty ounces to the dozen. The

average weight of hens' eggs is twenty-four ounces to the dozen, or eight to the pound.

It is usual to make no distinction in the market between the small, the average and the large eggs, which is a manifest injustice to the seller of large eggs. The only just way to deal in eggs would be by weight. While this is almost universally conceded to be the case, so strong is the custom of buying and selling by count that, so far as we know, there is no market in the world where eggs are sold by weight.

The average hen's egg is 2.27 inches in length and 1.72 inches in diameter at the largest place, and weighs about two ounces. The eggs of pullets are almost invariably smaller than those of hens more than one year old.

Duck eggs are considerably larger than those of hens and usually command a higher price. Guinea eggs are very pointed and considerably smaller than hens' eggs. Goose eggs weigh from 5.5 to 6.7 ounces, or about five pounds to the dozen.

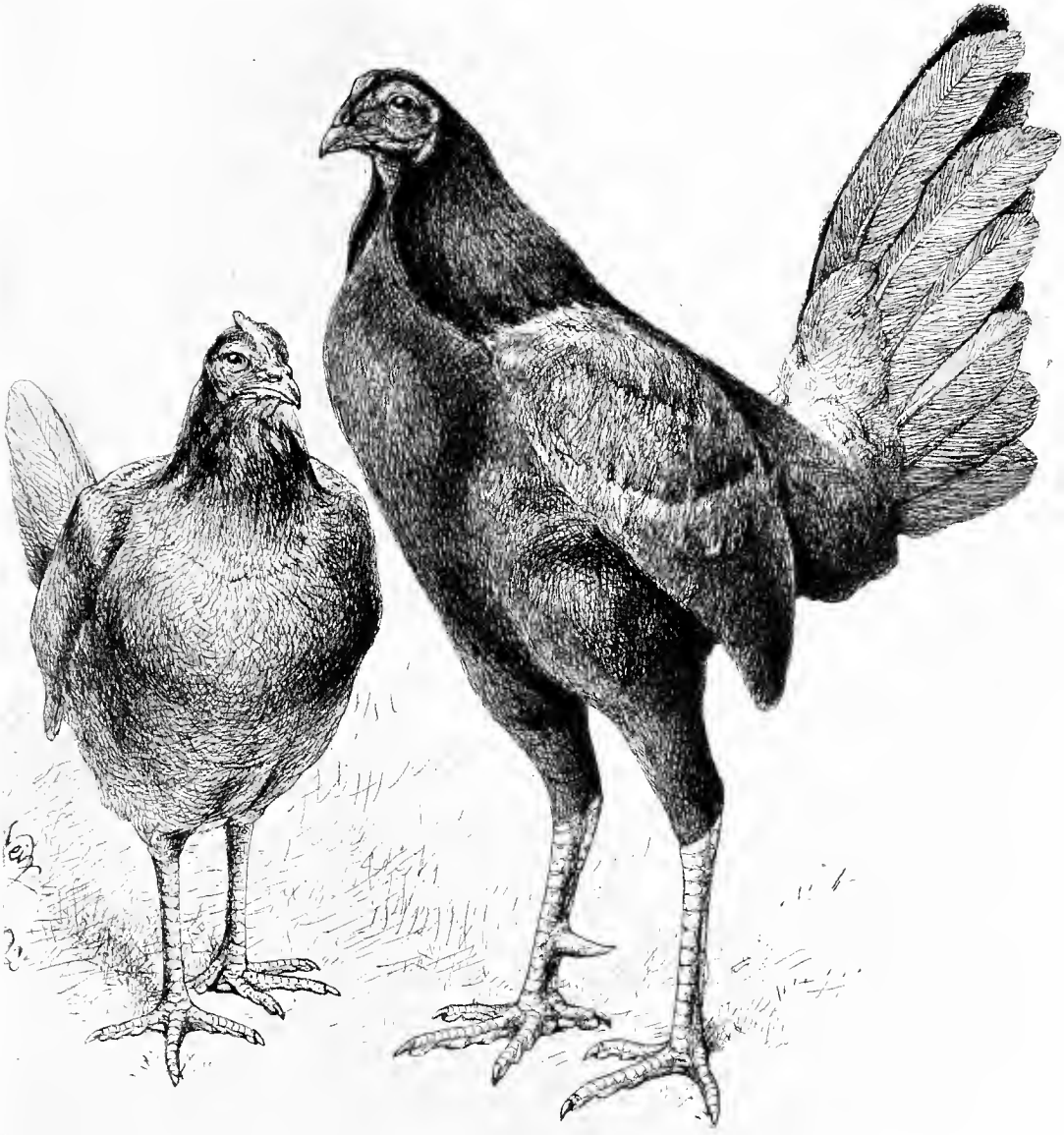
The average hen's egg is composed of about 11 per cent. of shell, 32 per cent. of yolk and 57 per cent. of white. Some experiments at the New York State experiment station indicated that the shells of white-shelled eggs are slightly heavier than those of brown-shelled eggs.

It is because the general public has become convinced of the nutritive value of eggs that they have assumed their present important position commercially.

While they have long been considered what is commonly called "strong" food, they have been looked upon as more of a luxury than a necessity, and the poorer people preferred to buy meats rather than eggs, as a matter of economy.

A curious error exists in some markets concerning the quality of eggs as indicated by the color of their shells. The people of Boston prefer eggs with dark shells and will pay the highest price for them, while the people of New York City prefer white-shelled eggs, and the highest priced eggs in that city are those having white shells. In Chicago there is no choice in the matter of the color of the shells, but it has been observed by those who cater to the high-priced trade that it is advisable to assort the eggs according to color and sell them in evenly colored lots.

As a matter of fact, it has been demonstrated by a series of careful analyses that there is no difference in the food value of eggs with different colored shells.



HENNY COCK AND HEN

The property of Mr. John Harris, of Liskeard.

Eggs have been articles of trade ever since this country was settled, but until quite recently they were not considered of great importance. The production of eggs was left entirely to farmers, and by them the production of eggs and poultry was not considered of great importance. As a rule, every farm supported a flock of mongrel fowls which were allowed to live by picking up stray grains about the farm and in the hog lots, and by foraging about the fields for insects, seeds and other food such as they could find. But little attention was paid to feeding them, and less to providing a place where they might sleep in comfort through the winter. Frequently no shelter whatever was provided for the fowls, they being compelled to seek out their own resting-places in outbuildings or in the trees about the farmstead.

No attempt was made to stimulate egg production, and such a thing as feeding for eggs was unheard of. It was the common belief that poultry did not pay for the damage it did to gardens and field crops; and the farm flock was allowed to exist as a somewhat necessary nuisance to furnish material to be used in cakes, puddings and other rural dainties, rather than with a view to revenue.

As a result of this lack of method and almost absolute neglect, eggs were not expected in winter, and were always scarce at that time in the year, while their plentifulness in summer made them so cheap that frequently they could not be sold except in the way of bartering them for goods at local stores. From three to six cents a dozen was the usual price in summer, and as there were none to be had at any price in the winter, it is not surprising that poultry was held in low esteem.

About the middle of the last century, some ships trading with the East Indies took on some very large fowls as a part of their food stores. Some of these had not been eaten when the ships arrived in port, and they were given to relatives of the captains of the ships, and at once created a sensation on account of their immense size. The fame of the great fowls from the Orient began to spread, and soon there was considerable excitement concerning them. Stories were told of fowls so large and tall that they could eat corn from the head of a flour barrel while they were standing on the ground, and every one became anxious to secure some of the large fowls.

This led to the importation of other fowls from the Far East, and the poultry industry received its first impulse, an impulse that was destined

to produce great results and effect a revolution in the business of producing poultry and eggs.

The first importations from Asiatic countries were tall, loose-jointed, awkward, ungainly fowls of various colors. Some were reddish yellow, others were grayish white, and others a mixture of almost every color known to the gallinaceous family.

They were known by various names, such as Shanghais, Brahma-Pootras, Chittagongs, etc. A few enthusiasts began to breed these various fowls with a view to producing a degree of uniformity, and the result was the evolution of several distinct breeds which are to-day known as Brahmas and Cochins, both of which breeds come in more than one variety. Later, Major Croad, of the British army, sent to England a distinct breed which he found in northern China, naming them, from the Chinese province from which they came, Langshans. These were afterward imported to this country, and since that time other importations of this breed have been made. The Langshans were practically perfected when first imported, and are now bred to models based on the original form and color.

This first beginning of the interest in pure-bred poultry was no doubt the foundation of the present great poultry industry of this country. Marvelous stories were told of their prolificacy, and the anxiety of the people to procure specimens caused them to sell for very high prices.

Several years before the first importation of fowls from India and China, there had been importations from Leghorn, Italy, but these had not attracted much attention. About this time more Italian fowls were brought over, and it was claimed for them that the hens would produce 200 eggs per year, and stories were told of specimens which had laid so many eggs that they died of exhaustion.

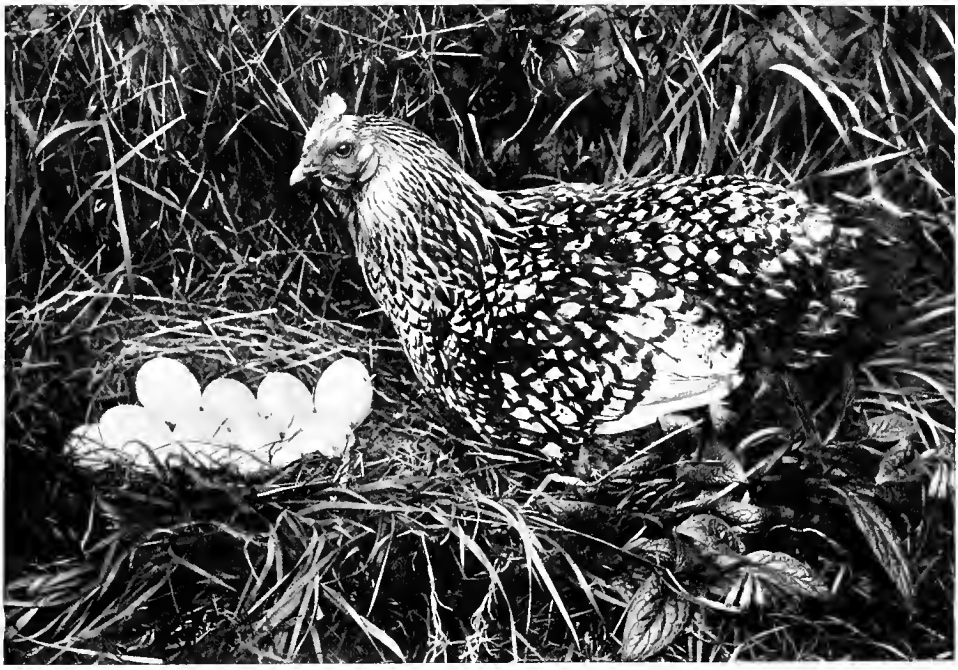
The history of the introduction of these foreign fowls is rather hard to unravel on account of conflict of authority, but the general facts are a matter of common agreement among those who were living at the time.

Just when it seemed that the whole people were about to become interested in poultry and the production of eggs, the Civil War began, and for the next five years the people of the nation were so deeply engrossed in military affairs that the poultry industry was allowed to sink out of sight, so far as the general public was concerned, although a few enthusiasts maintained an interest in the subject.

Soon after the close of the war poultry breeding again became a matter

of general interest, and beginning about 1870 the interest grew apace. The fowls imported from foreign countries had been selected, mated and bred until several distinct breeds had been perfected, and American breeders began to introduce new breeds derived from crossing and intermingling the blood of several of the older breeds.

Pure-bred fowls were imported and exported, and we began to hear of "fancy" poultry, as distinguished from the common stock of the



Photograph by Charles Reid, Wishaw, N. B.

SILVER WYANDOTTE HEN AND EGGS

country. Poultry journals were established, and the trade in poultry for breeding purposes and eggs from pure-bred poultry began to assume considerable proportions.

From that time down to the present the traffic in eggs has steadily increased in volume, and now eggs for hatching probably represent as large a volume of business as the entire trade in them did fifty years ago, while the transactions in eggs for food and other commercial purposes represent millions of dollars.

Formerly it was necessary to make some final disposition of eggs

within a comparatively short time after they were gathered, or they would become unfit for any use except for a few processes in the arts. This made it necessary to handle them rapidly and get them into the hands of consumers as quickly as possible.

Later the lime-water process of preserving or "pickling" them was discovered, and merchants and speculators bought large numbers of them when they were cheap and preserved them in great vats, in cellars, until the time of scarcity, when they were brought out and sold at an advance on the purchase price.

This method of keeping them was never entirely satisfactory, as the eggs deteriorated in quality to a marked degree, and pickled eggs were only used because fresh-laid ones could not be had.

Still later cold storage was devised, and as the processes by which a low temperature could be maintained for an indefinite period were improved more and more, eggs were put in storage in the summer when they were cheap to be held until winter when they were high priced, until now the business of putting eggs in cold storage is a very large one. Great cold-storage warehouses are to be found in all the large cities and many smaller ones in small cities and towns, and the business has assumed such proportions that it affects the market price of eggs both summer and winter.

In summer the cold-storage speculators bid against each other for stock to store until their demand increases the price. In winter, as soon as fresh-laid eggs become scarce and the consumptive demand raises the price, the cold-storage speculators withdraw their stocks from storage and put them on the market.

Thus it will be seen that the effect of the placing of eggs in cold storage is to make the price more uniform during the whole year than it was before such methods were practised.

Eggs are bought in April, usually, for cold storage, and kept in store until at such a time in winter as the price yields the holder a satisfactory profit.

It is not always a money-making transaction to store eggs in this way. Frequently the speculators bid the price for storage stock up to a figure that makes it impossible to sell at a profit. This is especially true if the winter should be a mild one and eggs should come in with any degree of regularity during the cold months.

With the present transportation facilities it is a matter of small

moment to transport eggs from the warmer parts of the country to the colder ones, and if those who live in the southern States would take advantage of the favorable climatic conditions that prevail in those States, and make a special effort for the production of eggs in large numbers, it would be a hard blow at the cold storage of eggs in the North.

The processes by which a case of eggs is gathered up in the country, sent to the city, placed in cold storage and finally disposed of is quite interesting.

Usually the eggs are gathered on the farms of the country and sold for cash or bartered for trade at the stores in the nearest town. Here they are packed in cases holding thirty dozen each and sent to the commission merchant in the city. The commission merchant sells them to the cold-storage speculator if a favorable price is offered. If the speculator does not offer enough for them, they are sold for immediate consumption.

Before going into cold storage they are sorted, as only perfectly good eggs are stored, and much care must be exercised in sorting, as a single broken egg if stored may be the means of spoiling several others that lie next to it in the case.

Candling eggs is a trade by itself, and in the large cities is done by a well-organized union or guild of experts, who command good wages, as it takes considerable practice to become an expert candler.

The term "candling" is used from the fact that sorting was formerly done by the light of a candle. Now electric lights are used, and it is much easier to select the good eggs than in was when a less brilliant light was used.

The candlers stand in a row facing a long bench or table in a hall that is perfectly dark, except where a ray of electric light shines through a small aperture in the opaque shade that covers the bulb. Attendants bring the eggs to the candlers and take them away after they are candled and assorted.

A case containing thirty dozen eggs is placed on the table in front of the candler, convenient to his left hand. From this he picks up six eggs, three in each hand, and by a peculiar twisting motion of his fingers rapidly revolves each egg before the aperture in the light-shield, thus bringing the egg between his eye and the light. The light shining through the egg shows him at a glance what classification it deserves.

If the light shows evenly in all parts of the egg-shell it is called "fancy"; if there is a faint tinge anywhere in it it is called "strictly fresh"; a more

pronounced discoloration places it in the class of "fresh eggs." Either of these classes are perfectly sound and wholesome and fit for human consumption, the slight discoloration in "strictly fresh" and "fresh" eggs being the result of age that allows the yolks to settle to one side slightly. Any of these three classes may be kept in cold storage for an indefinite time, under proper conditions.

If the candler sees a decided dark spot through the egg as he examines it he calls it a "second," and if this spot is quite dark it is called a "spot." In a more pronounced condition of decay it becomes a "rot."

Seconds and spots are sold to the cheaper trade, as they have not yet got so far along as to be detrimental to the health, and a certain kind of cheap trade disposes of them. Seconds, it is said, are frequently sold to bakers, a statement that we have never cared to attempt to disprove.

Broken eggs are revealed to the candler as he gently knocks the eggs together, his quick sense of hearing revealing this condition. As he discovers the condition of the eggs they are placed in different receptacles, each classification by itself. These candlers work with remarkable rapidity and make their decisions without hesitation.

A machine has been devised to do this work, but it has never come into common use. In this machine the lights are under a rolling platform which carries the eggs along, the candler standing beside the platform and selecting and assorting the eggs as they pass him. Those that are not "fancy" or "strictly fresh" are picked off the platform, while those that are allowed to remain are carried along and deposited in a receptacle at the end.

After the eggs are assorted, those with the cracked shells are broken by girls, who separate the whites from the yolks, placing each in tin cans. When a can is full of either whites or yolks it is taken to the freezing-room and frozen, to remain in that condition until sold. In some cases the whole contents of the egg-shell are canned in this way, frozen and shipped out of the country, large numbers of canned eggs being sent to Alaska every year since the gold mines were discovered in that territory.

Even the shells of the eggs that are broken for canning are saved and used for various purposes, such as one of the ingredients of poultry foods.

The eggs that are to be stored are placed in rooms kept cool by various processes, usually by one similar to the one by which artificial ice is frozen, and kept at a low temperature, a degree or two above freezing. The

FOWLS SCRATCHING BEFORE THE BARN DOOR

management of a building in which eggs are stored requires nice manipulating. The temperature must be kept even, and the degree of moisture in the air regulated to a nicety. If there is too much moisture in the air the quality of the eggs will be injured, and if there is not enough moisture the contents of the eggs will be likely to evaporate and injure their selling quality.

Another way of keeping eggs in condition for use while being transported to foreign countries is by desiccating them. This method is not yet in general use, and it is doubtful if it will ever become popular, as dried eggs are not likely to become a favorite article of diet except where conditions make it necessary to have them reduced in bulk to the smallest dimensions. These exceptional calls for desiccated eggs are numerous enough to keep several large establishments busy.

It is impossible to obtain data concerning the commercial transactions in eggs further back than a few years, as they were not considered of enough importance to become objects of statistical information. The writer was one of the first to call attention to neglect in this direction, and some years

ago spent considerable time in an endeavor to estimate with some degree of accuracy the number of eggs produced in this country. When these statistics were first given out they were received with incredulity, and were the subject of much good-natured raillery. However, when serious attention was given to the matter it was found that the estimate was lower than the facts justified.

Even yet it is very hard to obtain accurate information on this point, as the average farmer still suspects that his hens are not very profitable, although this error is rapidly being dissipated by the mass of facts that are being placed before him by the experiment stations, government statisticians, State and national, and by private individuals who are interested in giving the facts the widest publicity.

The poultry press of the country has become a great means of disseminating information on this subject, there being now in the United States about sixty journals devoted especially to the poultry industry, several of which have a wide circulation, one as many as 100,000 copies each issue.

For the purpose we have in view it is not necessary to go very far back into the statistical records, even if it were possible to do so. Except as a matter of curious information, it is not necessary to know how many eggs were produced one hundred years ago, nor what they were valued at.

One remarkable phase of the subject is the rapid increase of the egg production of the country. While the statistics on this subject are no doubt faulty to the extent that they do not with any degree of accuracy give the number of eggs produced in this country, being entirely too low, yet for purposes of comparison, one year with another, they answer very well in showing the increase of the industry.

While the average farmer knows almost exactly how many bushels of wheat or how many pounds of wool he produced the year before, he very rarely knows how many eggs were produced on his farm. The writer has had occasion to talk on the subject before a great many audiences composed of farmers, and has many times asked that every one in the audience who knew exactly how many fowls there were on their farms would rise to their feet. There never has been a response to a request of this kind, except on one occasion a farmer arose and said he knew to a certainty how many hens he had. When asked how many, he triumphantly replied, "One," and sat down amid a roar of laughter.

SILVER-GREY DORKING COCK

Mr. Arthur C. Major's Crystal Palace (1902) prize winner

Because of this general apathy concerning exact statistics relating to the poultry industry the estimates furnished by various departments are not at all exact, nor can they compare for accuracy with the statistics on this subject published by European governments.

According to the census of 1890, the number of eggs produced during that census year was 820,000,000 dozen, in round numbers. During that year this country imported 15,000,000 dozen, which were valued at the point from which they were imported at $2,000,000. In 1890 this country exported 381,000 dozen, valued at $59,000. Ten years later but 225,000 dozen were imported, valued at $21,000, and the same year 3,694,000 dozen were exported, valued at $641,000.

In 1901 the importation of eggs had fallen to 126,520 dozen, valued at $10,515. The same year egg-yolks were imported to the value of $246. In 1900 we exported 5,920,727 dozen eggs, valued at $984,081, and egg yolks valued at $883. Thus it will be seen that during ten years there has been a complete reversal of conditions so far as supplying the domestic demand is concerned.

The increase in numbers is also very marked. As stated above, the number of dozen produced in 1890 was 820,000,000, while according to the census returns of 1900 the production during that census year amounted to the immense number of 1,293,819,186 dozen. These at twelve cents a dozen were worth $155,258,302, an immense sum for an industry that only a few years ago was not considered of enough importance to have a place in the industrial statistics of the country.

If we consider in this connection the number of eggs produced in Canada the industry would make a still more impressive showing, as that country has also been making rapid strides in egg production, and the export trade has had the careful attention of the experiment stations, which have encouraged it and have been at considerable expense to educate the farmers of the Dominion concerning the importance of the industry and the most economical methods for producing eggs.

Besides the regular commerce in eggs that are gathered up and distributed in the usual channels of trade, a great volume of business is done in many parts of the country in the way of supplying eggs to private families. With the increase of wealth in this country has come a class of people who are willing to pay extra prices for articles of the finest quality. Poultrymen, taking advantage of this fact, have begun catering to

this trade, and around the larger cities are many poultry farms the owners of which sell eggs to private families at prices much higher than that paid in the open market. The best hotels, restaurants and clubs also prefer to buy all their eggs from one farm when they can do so, and are willing to pay fancy prices for guaranteed stock.

It is customary for these egg-farmers to guarantee every egg they sell to be perfectly fresh and not over a certain age, some living near their customers making the outside limit as low as forty-eight hours.

In some cases the egg-farmers live as far as 300 miles from the market they cater to, this distance allowing quick delivery by express. In New York State there are a number of egg-farms the owners of which receive large revenues from their egg trade alone, and all of the large cities are becoming surrounded by farms of this kind, which are very profitable.

Some of these egg-farmers receive a stated price, say fifty cents a dozen from November 1 to May 1 and a somewhat lower price for the remaining months of the year. Others receive a stated advance on the highest market price the day the eggs are sent to market. One of these whom we know receives fifty per cent. above the highest market price and another receives fourteen cents a dozen above the highest open quotations, whatever they may be.

This is a branch of the business that is capable of almost indefinite expansion, as the demand for fancy eggs increases much more rapidly than the supply.

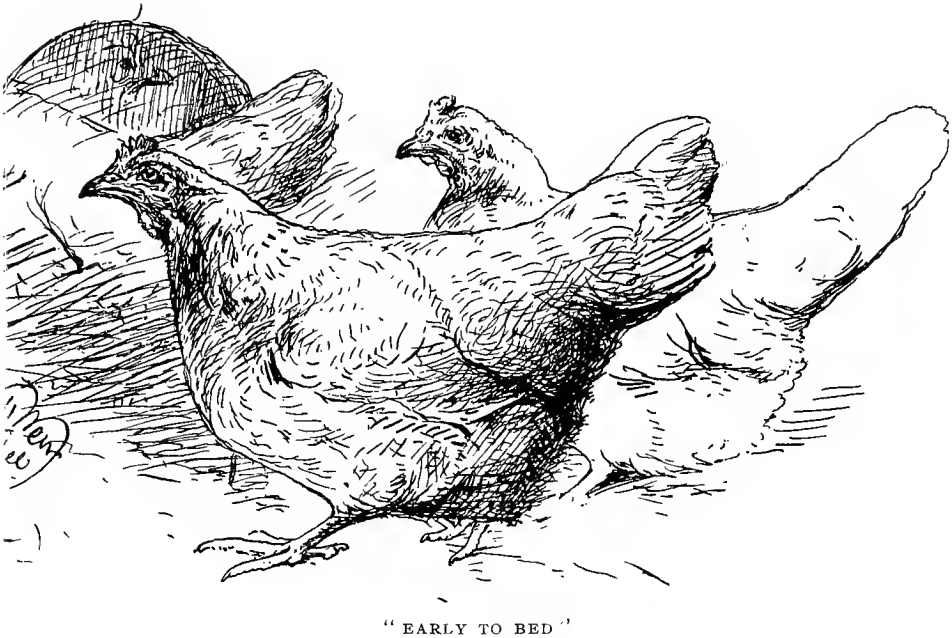
In the vicinity of Petaluma, California, there is a whole community that makes the production of eggs almost its only work. These eggs are sold in San Francisco, and the number shipped from the one small town is marvelous.

It is estimated that about 100,000 hens are kept in the immediate vicinity of Petaluma, and the net profit from these is from $1 to as high as $2.50 each in a year. This town is the most distinctively poultry town in America, and its trade is constantly increasing. Here it is that we see to what an extent the trade in eggs may be developed by carefully educating the people to an appreciation of its possibilities.

With present facilities for cold storage on long voyages there is no reason why the United States might not develop the trade in eggs until it would become one of the leading if not the foremost industry in the country.

A considerable branch of the trade in eggs is that of buying and selling

eggs for hatching. What this amounts to it is impossible to estimate even approximately, but that it amounts to a large sum is evident from the number of poultry breeders who annually advertise eggs for hatching for sale. Some of the poultry journals have as many as 1,000 advertisements of eggs for hatching in a single issue during the season when eggs for hatch-



"EARLY TO BED"

ing are in demand, and single breeders sell thousands of dollars' worth every year.

Eggs for hatching are rarely sold for less than $1 per dozen and frequently for much more. Breeders of great reputation sell eggs for as high as $6 for thirteen, and one at least gets $1 each for eggs from his best fowls and cannot supply the demand at this price.

While the business of buying and selling eggs has grown to be one of great proportions, it is very generally believed by those who have given the matter attention that it is yet in its infancy and that it will continue to grow indefinitely and expand into one of the great branches of the commerce of the world.

As the country becomes settled and the inhabitants crowd more closely together the production of beef, pork and mutton must continually

decrease, as compared with the increase in the population, and this will very naturally turn the attention of the public in other directions for food to supply the place now taken by meats.

Poultry can be kept on a very limited area, and the production of eggs can be carried on in confined quarters, and eggs will largely take the place of meat.

These conditions, together with the increasing liking of the consumer for eggs as a regular part of the daily food, lead us to believe that the commercial egg is destined to become of more and more importance as time passes.

Foreign Eggs

Of foreign eggs the American poultryman of to-day knows but little from experience. As has been stated, but few eggs are imported into this country from other countries, and a large per cent. of these are from Canada, which we have ceased to think of as a foreign country, this being especially true of poultrymen, who regard their Canadian brethren as compatriots, and in no sense foreigners.

The duty of five cents a dozen that is collected on all eggs that are imported into this country makes it unprofitable to bring them across our borders in large numbers, except at times when they bring exceptionally high prices, and the bulk of the importations come from that part of Canada bordering our own country, these being carried over by the producers and sold in towns and cities that lie on the border, such as Buffalo and Detroit.

The average price of imported eggs for the five years from 1892 to 1896, both inclusive, was 11.8 cents per dozen, while the average price for the five years from 1897 to 1901, both inclusive, had fallen to 7.8 cents per dozen. During this period the price fluctuated from 4.9 cents per dozen in 1898 to 9.5 cents in 1899.

A considerable number of eggs are received from foreign countries for hatching, but no statistics concerning this branch of the industry are available, as eggs for hatching are listed with those imported in a commercial way.

The Chinese import a good many eggs which have been prepared for food in the ways peculiar to that people, one Chinese delicacy being eggs that have been buried for several years and are then used as appetizers.

It is not at all probable that the import trade in eggs will increase

beyond its present limits unless prices should become very much higher than they are now in this country.

This country is rapidly increasing the number of eggs produced, and is now able to export large numbers at a profit, while those imported are made more costly by the duty imposed on them.

The production of eggs in this country will naturally become more and more a regular business, and the economies that are constantly being devised, and the improvement in the laying qualities of our hens, which is becoming more pronounced under the stimulus of good prices and insistent demand, will make it possible for American poultrymen to compete in the open markets of the world with the poultry breeders of any other country.

For these reasons the subject of foreign eggs has but little interest for American poultrymen except as it relates to the methods that obtain in those countries, and then only as a matter of information that has no bearing on the financial aspect of the industry.

Photograph by courtesy of "Commercial Poultry"

WHITE WYANDOTTE COCK

Owned by C. J. Larson, of Illinois

Poultry Interests in the United States in 1900

States and Territories	Number of Farms	Number of Farms Reporting	Number of fowls 3 months old and over. June 1, 1900.				Value of all Poultry June 1, 1900	Value of Poultry Raised in 1899	Dozens of Eggs Produced in 1899	Value of All Eggs Produced in 1899
			Chickens including Guinea-fowls	Turkeys	Geese	Ducks				
The United States	5,739,657	5,096,252	233,598,085	6,599,367	5,676,863	4,807,358	$85,794,996	$136,891,877	1,293,819,186	$144,286,158
North Atlantic division	677,506	605,732	27,952,114	529,932	144,527	453,580	13,706,762	20,624,439	191,764,000	28,612,489
South Atlantic division	962,225	850,074	22,293,012	810,075	908,908	458,918	8,545,899	15,553,805	105,349,996	11,687,293
North Central division	2,196,567	2,014,138	123,469,068	3,072,456	1,899,026	2,416,327	43,416,629	69,828,121	716,663,710	74,208,117
South Central division	1,658,166	1,441,315	50,299,631	1,876,382	2,589,164	1,257,084	15,672,938	24,770,049	222,096,860	20,465,926
Western division	242,908	184,021	9,551,296	304,950	135,163	199,977	4,414,365	6,053,738	57,787,867	9,266,716
Alabama	223,220	191,383	4,737,606	129,326	243,657	75,947	1,409,269	2,263,346	18,778,960	1,825,978
Alaska*	12	5	176	.....	.....	.....	166	179	1,043	360
Arizona	5,809	3,304	165,200	6,043	840	2,439	80,798	114,884	819,507	163,274
Arkansas	178,694	156,922	5,393,157	140,661	378,475	180,583	1,540,006	2,179,634	25,694,860	2,328,509
California	72,542	55,479	3,947,200	158,356	28,419	32,293	1,877,489	2,492,067	24,443,540	3,864,679
Colorado	24,700	19,281	968,761	30,781	2,576	15,002	393,219	587,536	5,704,290	852,978
Connecticut	26,948	23,064	1,073,026	7,717	3,530	14,100	644,050	984,207	7,959,430	1,523,319
Delaware	9,687	9,312	628,866	19,045	6,438	10,933	357,475	596,391	3,571,870	488,401
District of Columbia	269	95	8,004	46	16	227	3,108	5,480	42,580	6,492
Florida	40,814	34,950	1,107,816	32,869	36,658	6,877	394,557	574,703	4,214,186	553,534
Georgia	224,691	195,136	4,549,144	103,416	208,997	64,895	1,458,055	2,481,610	15,505,330	1,615,538
Hawaii*	2,273	967	31,888	4,672	75	21,508	38,237	61,546	155,710	45,257
Idaho	17,471	12,739	516,412	10,211	3,850	9,536	203,127	282,468	2,879,590	405,504
Illinois	264,151	247,034	16,600,728	446,020	307,657	382,857	6,415,033	11,307,599	86,402,670	8,942,401
Indiana	221,897	208,652	11,103,006	345,379	271,004	230,432	4,222,409	8,172,993	70,782,200	7,441,944
Indian Territory	45,505	40,575	1,960,505	92,509	77,216	88,069	515,384	647,844	6,949,640	625,418
Iowa	228,622	214,832	18,907,673	424,306	223,612	487,752	6,535,464	9,491,819	99,621,920	10,016,707
Kansas	173,098	155,834	11,966,843	275,330	97,768	216,244	4,356,997	6,491,183	73,190,590	7,237,111
Kentucky	234,667	211,891	6,849,079	279,749	541,576	185,064	2,723,221	4,970,063	35,337,340	3,460,607
Louisiana	115,969	89,695	3,890,563	115,921	169,936	123,059	1,057,889	1,425,116	12,820,290	1,281,713
Maine	59,299	48,043	1,564,853	6,437	4,566	9,708	756,153	955,468	13,304,150	2,038,225
Maryland	46,012	42,295	2,113,544	101,782	33,389	56,930	1,158,020	2,077,490	12,511,450	1,572,682
Massachusetts	37,715	30,504	1,625,269	3,018	6,389	46,017	1,018,119	1,407,681	12,928,630	2,571,341
Michigan	203,261	185,241	8,033,531	191,863	73,267	106,399	2,685,829	4,551,945	54,318,410	6,104,462
Minnesota	154,659	136,623	7,730,940	193,143	90,975	127,635	2,274,649	2,927,717	43,208,130	4,437,148

*Data for Alaska and Hawaii included in totals for United States, but not in those for the five geographical divisions.

Poultry Interests in the United States in 1900—*Continued.*

States and Territories	Number of Farms	Number of Farms Reporting	Number of fowls 3 months old and over. June 1, 1900.				Value of all Poultry June 1, 1900.	Value of Poultry Raised in 1899	Dozens of Eggs Produced in 1899	Value of All Eggs Produced in 1899
			Chickens including Guinea-fowls	Turkeys	Geese	Ducks				
Mississippi	220,803	187,562	5,194,856	189,698	357,963	95,668	1,655,319	2,387,484	18,942,090	1,871,765
Missouri	284,886	265,203	14,903,601	466,665	428,307	278,140	5,720,359	9,525,252	85,203,290	8,315,371
Montana	13,370	9,830	531,774	12,637	2,629	9,639	296,806	398,487	3,002,890	631,143
Nebraska	121,525	108,504	7,417,837	118,892	74,007	201,503	2,374,930	3,299,044	41,132,140	4,068,002
Nevada	2,184	1,690	100,661	3,618	880	2,379	55,826	71,175	589,490	122,522
New Hampshire	29,324	23,500	870,461	2,386	1,289	3,803	467,104	610,696	7,005,180	1,213,703
New Jersey	34,650	30,958	1,993,594	32,378	10,518	40,024	1,300,853	2,265,816	11,942,816	1,938,304
New Mexico	12,311	5,556	156,853	3,805	830	1,527	62,419	90,152	839,890	157,175
New York	226,720	206,389	8,964,736	190,879	45,933	150,864	4,310,755	6,161,429	62,096,690	8,630,062
North Carolina	224,637	196,721	3,871,858	120,737	284,424	102,942	1,434,158	2,689,970	17,704,020	1,810,116
North Dakota	45,332	34,464	1,409,285	39,073	17,206	23,816	477,358	594,751	7,438,400	782,790
Ohio	276,719	256,824	14,269,525	362,924	179,665	206,238	5,085,921	8,847,009	91,766,630	10,280,769
Oklahoma	62,495	51,012	2,527,533	86,450	12,934	71,562	900,743	1,302,460	13,724,900	1,284,414
Oregon	35,837	29,997	1,290,818	36,031	26,580	19,774	582,524	826,687	7,709,070	1,162,071
Pennsylvania	224,248	209,697	10,533,106	259,824	60,780	171,271	4,483,486	7,151,243	67,038,180	9,080,725
Rhode Island	5,498	4,866	500,618	4,604	6,335	8,957	305,047	398,790	3,217,310	656,845
South Carolina	155,355	132,401	2,664,784	120,140	83,543	39,852	899,953	1,539,755	9,007,700	925,966
South Dakota	52,622	44,756	3,028,700	53,740	33,334	62,511	856,966	1,020,382	17,349,750	1,727,392
Tennessee	223,623	207,562	6,184,210	193,397	391,698	202,432	2,275,864	4,282,740	31,807,990	3,115,335
Texas	352,190	304,713	13,562,302	648,671	415,709	234,664	3,595,243	5,311,362	58,040,810	4,672,000
Utah	19,387	16,145	534,842	10,649	2,759	8,503	186,922	262,503	3,387,340	424,628
Vermont	33,104	28,711	806,451	22,689	5,187	8,836	421,195	689,109	6,271,880	959,965
Virginia	167,886	154,123	4,590,311	207,675	125,495	117,989	1,886,768	3,744,654	25,550,460	2,836,899
Washington	33,202	26,340	1,196,639	29,155	64,488	66,433	614,838	848,291	7,473,790	1,259,225
West Virginia	92,874	85,041	2,759,585	105,265	129,948	58,273	963,805	1,843,752	17,242,400	1,877,675
Wisconsin	169,795	156,171	8,097,399	155,121	102,224	92,800	2,410,714	3,398,427	46,294,580	4,854,020
Wyoming	6,095	3,660	142,136	3,664	1,312	2,452	60,397	79,488	937,570	163,517

HAMBURG COCK'S HEAD

EGGS FROM A GENERAL POINT OF VIEW

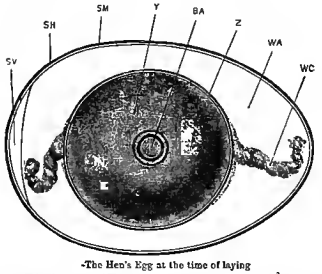
MILLER PURVIS, ILLINOIS

ASIDE from its commercial importance the egg has always been an article of diet that has been held in high esteem, even the most ignorant savages understanding its nutritious qualities. Perhaps no article of diet is more universally used than eggs. They are esteemed by all nations and every shade of religious belief except, perhaps, some of the stricter sects of India. Not only are the eggs of domestic poultry used, but those of wild birds, turtles and fish are held to be a delicacy by the different nations, according to the degree of civilization and national customs. The Eskimos of the Far North seek the eggs of wild fowl, while the natives of tropical countries dig in the sand for the eggs of turtles as delicacies to be added to their food-supply. Even in civilized countries eggs of certain wild birds are sought for food, and the eggs of wild duck, plover, herons and other wild fowl are freely eaten, and are, in fact, wholesome and nutritious.

The more civilized people could hardly dispense with it, and its place in the dietary rises in importance as cooking becomes more esteemed as one of the sciences. While the egg has always been highly esteemed as an article of food, its real value has only recently been demonstrated by chemical analyses and careful experiments. Many extremely interesting experiments have been made in testing the quality of eggs as an article of diet, and some of these have produced surprising results.

Structure of an Egg

An egg is curiously constructed, and it may be interesting to examine briefly how it is built up. The egg consists of three parts, commonly recognized. These are the shell, the white and the yolk. The shell is composed of calcareous crystals so united that it is very porous, allowing the ingress of oxygen in the process of incubation and the egress of carbon dioxid, one of the poisonous waste products of the processes of life. Inside the outer shell is a membrane of a fibrous nature, which is closely attached to the inner surface of the shell, except at the larger end, where it is divided and forms a disk-shaped cavity which is known as the air-space or air-bubble (*sv* in the illustration). Inside the inner membrane is a viscid fluid commonly called "the white," which consists of 84 per cent. water, 12½ per cent. albumen, 1 per cent. mineral matter and 2½ per cent. sugar. Suspended in the white is the yolk, a yellowish spherical mass of matter consisting of 52 per cent. water, 45 per cent. oil and about 1 per cent. each of coloring matter, albumen and mineral matter.



The Hen's Egg at the time of laying

BA, blastoderm. SH, egg shell. SM, shell membrane. SV, air chamber. WA, white or albumen. WC, chalaza, or twisted cord of denser albumen. Y, yolk. Z, vitelline membrane.

[Adapted after Marshall]

The albumen or white is of different degrees of density. The yolk retains its spherical shape for a considerable time, owing to the fact that it is enclosed in a transparent membrane called the vitelline membrane. The yolk, as shown at *y*, also consists of several layers enclosing a small whitish ball or sphere, from which extends a canal terminating in a vesicle known as the germinal vesicle. From opposite sides of the yolk extends twisted filaments, as seen at *wc*, denser than the white, called the chalaza, which are attached at the inner and large ends to the vitelline membrane and to the inner membrane of the shell at the outer ends. The purpose of this is to hold the yolk in position and at the same time act as a spring to counteract the effect of sudden shocks.

The germinal vesicle is of such a nature that it invariably keeps the side of the yolk to which it is attached on the upper side. This germinal vesicle is the spot where the spermatozoa of the male is deposited after copulation, and its characteristic of always coming to the top, no matter how the eggs may be turned, is a natural provision that

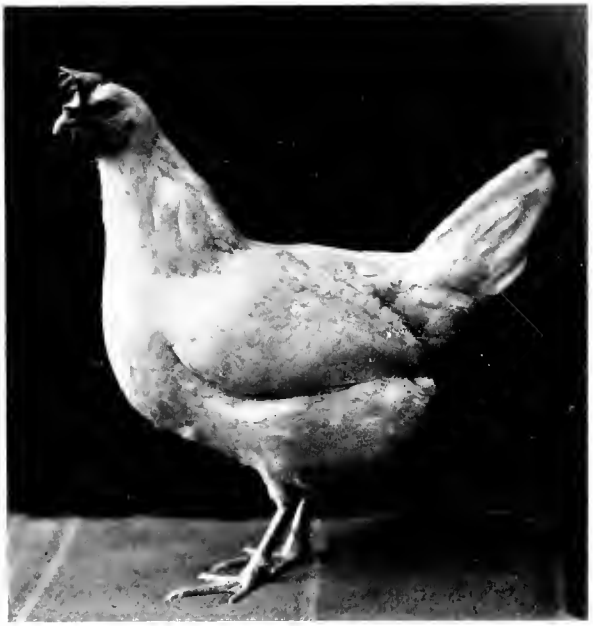
always keeps the embryo in such a position that the heat of the incubator or of the setting hen is next to the embryo chick.

The yolk of the egg is formed in the egg-sac or ovary of the hen or other female bird, and at the proper time, depending largely on the food consumed and the time of the year, a yolk is detached from the several that are to be found in the ovary and passes down the oviduct, the albumen being deposited in the course of this passage, the inner membrane forming, and finally the shell, and the perfect egg is expelled. As a rule, it requires about two days for the yolk to become a perfect egg, but in several breeds of hens eggs will be produced several days in succession, and in exceptional cases this will continue for a considerable period, and an egg will be deposited every day for a number of days.

The process by which the inner membrane is formed is not well understood, but it is known that the shell is formed by the deposit of minute crystals of lime on the inner membrane. Sometimes eggs will be deposited without the outer shell, or with such a thin coating of shell material that it breaks when touched. The inner membrane is usually strong enough to hold the contents from being lost. These are known as soft-shelled eggs, and are due to overproduction, or to some abnormal condition of the organs that causes a suspension of the functions to the extent that lime is not elaborated in sufficient quantity to supply material for the shell. It will be seen that an egg is a very complicated structure, composed of the most fragile materials, yet so put together that it will withstand considerable rough usage without material damage being done to it.

If a fresh egg is boiled hard and carefully dissected the different parts can readily be distinguished and the several layers of the white and yolk can easily be separated. Naturally eggs are not constructed for any rougher usage than they would receive by being deposited in a nest and covered by the female during the course of incubation. When carried long distances by the ordinary means of transportation the several parts are very likely to be disassociated to some extent, but if allowed to stand for a day or two the natural condition will return.

Eggs are of various colors and the shells differ greatly in thickness and strength. The eggs of most wild birds seem to have been designed by nature in such colors as will cause them to be inconspicuous when unprotected in the nest, but there are notable exceptions to this, as the



WHITE LEGHORN HEN—A PRIZE-WINNER
Owned by Henry Van Dreser, New York

light-blue egg of the robin or the pure white one of the dove, both in striking contrast to the material usually found in the nests of these birds.

The eggs of domestic poultry vary greatly in size, as has been noted in a previous chapter. The egg of the bantam will weigh about fourteen ounces to the dozen, while that of the goose will weigh as much as five pounds to the dozen.

While not strictly along the line of this work, it is interesting to note that all eggs are not identical in chemical composition. Birds are divided into two distinctive classes. The young of one class are hatched with a full coat of feathers, and of the other without plumage. The common domestic hen belongs to the first class, the plumage being represented by down, and the robin, dove and other birds are among the second class.

It is apparent that the egg that contains the elements which will furnish a complete bird, including the plumage, must be more nutritious than one that produces a bird without plumage. The eggs of the first class are found on analysis to be the most nutritious. While it is commonly believed that eggs contain all the elements of nutrition, this belief is an error. It is true they contain all the elements necessary to the growth of the young bird, just as milk is the natural and sufficient food for young mammals, but eggs are not composed of all the elements of nutrition necessary to mature growth.

Eggs as Characterized by Breeds

The eggs of birds have a wide range of color, as has been noted, but those of domestic hens are not especially different. The colors range from

pure white, through shades of cream color to yellowish brown or pink with a purple tinge. The eggs of each breed have a distinct range of colors of their own that do not vary, although several breeds may produce eggs of the same general color. It is also true that individual hens often produce eggs of a distinctive shape, which is easily recognized by the poultry keeper who pays close attention to his flocks.

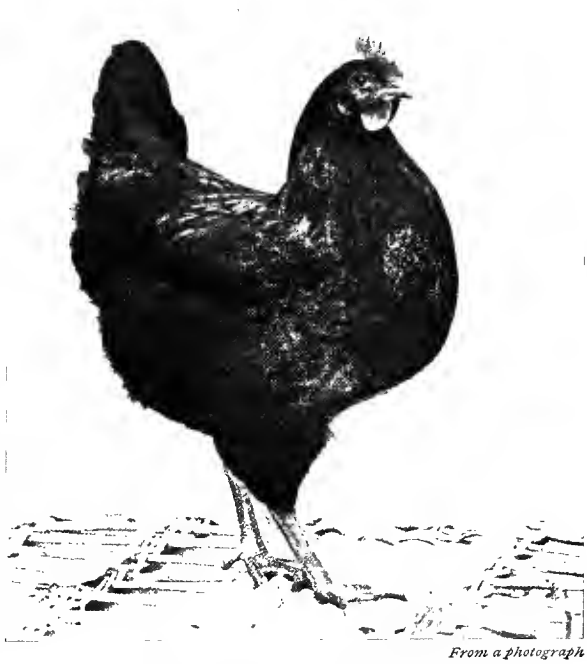
It has been determined, after repeated experiments, that the weight of eggs in different individuals in the same breed of fowls will vary considerably, and it has been noticed that generally the hen producing the largest number of eggs will produce eggs that are smallest or weigh the least, although this is not invariably the case.

The Hamburg class, which is acknowledged to be among the most productive of all domestic poultry, produces the smallest eggs of any breed.

The Leghorn family is probably next to the Hamburgs in egg-production, and the eggs of hens of this family are rather small, although recent attempts at producing a strain that will produce large eggs seem to be meeting with some success.

The Minorcas produce very large eggs and a great number of them. They are a much larger breed than the Hamburgs and considerably larger than the Leghorns, but not enough so to account for the difference in the size of the eggs produced by them.

The eggs of the Asiatic family, which includes the several varieties of Cochins and Brahmas, are of good size, but this class is not included among the prolific layers. It would not be fair, however, to leave the



From a photograph

OLD-STYLE BLACK ORPINGTON

impression that all Cochins and Brahmas are poor layers, for there are records of very notable exceptions to such a rule. Light Brahma hens have been known to produce as many as 233 eggs in a year, and no doubt proper attention to food and care would place this class in a higher position than it now holds in this respect.

For the last twenty-five years poultrymen have been paying more attention to perfecting the shape and color of the various breeds of poultry than to the production of eggs, and this has beyond dispute led to a falling off in egg-production. The establishing of egg farms in various parts of the country has led to the more careful selection of hens with great productive capacity. Several of the experiment stations have introduced the trap-nest, by which hens may be identified with the eggs laid by them, and by this means flocks of great egg-producing capacity are being built up and strains are being established which will lead to a much greater average production per annum than is now the case.

Influence of Feed upon Eggs

The public is largely in error concerning the nutritive qualities of eggs. It is quite generally believed that an egg with a deep yellow yolk is more nutritious than one with a yolk of a lighter color. It is also commonly believed in some communities that an egg with a dark shell is more nutritious than one with a pure white shell. Careful analyses fail to uphold these opinions, which have no foundation on any well-considered theory.

It has been found by repeated analyses that the color of the yolk or the color of the shell makes no difference in the nutritive value of the eggs. Eggs may vary slightly in nutritive value, but the analyses indicate that the variation happens as often between eggs from hens of the same breed as between those of different colors or shades of yolk or shell.

In the matter of flavor there is a very wide difference in eggs. While no breed can be said to furnish eggs of a distinctive quality, the eggs from one breed of hens being exactly similar in flavor to those of another, yet the difference between the eggs of two flocks of the same breed, kept under different conditions, may be very marked.

Fowls that are fed on clean, wholesome feed are superior in flavor to those fed on inferior or tainted feed of any kind. Even musty or molded grain, which fowls will eat readily, may impart to eggs a flavor that at

once marks them as lacking in that delicious one that belongs to eggs of the highest class.

Fowls fed on clean, sweet feed, sound grains, untainted animal feed and sound vegetables furnish the highest quality of eggs. It is not necessary that this should be such food as human beings would eat to make the egg perfectly good and of fine flavor. A hen roaming the fields may pick up many insects and much food material that would not be considered fit for human use but which is essentially free from decay or other unwholesome qualities. Such substances may in the laboratory of the egg organs of the hen be transformed into eggs that could not be distinguished from those produced by the most careful attention to feeding. When hens are allowed perfect liberty and select their feed from manure piles and decaying animal or vegetable matter, the eggs take on a flavor that is at once detected by any one who attempts to eat them after being accustomed to eggs produced from clean and wholesome food-stuffs.

FIRST PRIZE SILVER WYANDOTTE COCKEREL
Owned by James Arthur, Canada

Experiments at the North Carolina Experiment Station showed conclusively that hens fed on strong-flavored feeds produced eggs with a flavor characteristic of the feeds provided for them. When hens were given onions freely the eggs were so strongly flavored with onions that they were unfit for food, and several days elapsed before this flavor disappeared.

The New York Experiment Station made an exhaustive study of the effect of the feed eaten by hens on the eggs produced by them, and these

experiments led to the conclusion that hens fed on highly nitrogenous feeds produced eggs that were inferior in flavor to those produced by a carbonaceous ration. They had a disagreeable flavor and odor, the eggs and yolks were smaller and the keeping qualities not so good.

At the Hatch Experiment Station, in Massachusetts, cabbage and clover were fed to different lots of hens, and it was found that the eggs from hens fed cabbage, while heavier and containing a larger percentage of dry matter, were inferior in flavor and cooking qualities to those from hens fed clover.

It is logical to conclude from these several experiments, all of which were very carefully conducted by those with experience in experimental work, that the quality of eggs depends in a great measure on the quality of the feed the hens consume.

To sum up the whole matter, it is perfectly safe to say that color of shell, color of yolk or breed has nothing to do with the nutritive value or flavor of eggs, but that feed is the sole factor that influences for good or bad in this respect.

Eggs of Other Fowls

The eggs of turkeys are so seldom used for human food that it is not worth while to consider them in this connection. Those of ducks are considered "rank" and of an undesirable flavor for human food, although a goodly number are used for this purpose. They are so much larger than hens' eggs that they command a premium of a few cents a dozen in most places, and for this reason farmers usually sell them, reserving hens' eggs for their own use. Bakers and confectioners are partial to the eggs of ducks, as they are said to be superior to hens' eggs for their uses.

Goose eggs are also of more pronounced flavor than hens' eggs. They are often sold in the markets at about twice the price of hens' eggs, and, like duck eggs, go generally to bakers and confectioners.

The eggs of the Guinea-fowl are quite small and are not greatly esteemed on this account, although the flavor is not at all disagreeable, the Guinea being rather dainty in its selection of feed, searching diligently for worms, insects and seeds. The number produced is inconsiderable and probably is not increasing.

Judging Eggs

There is really no standard by which eggs are judged in this country. It is so seldom that a prize is offered for eggs that no serious consideration

WHITE LEGHORNS

The property of MRS. LISTER KAY. *Winners of many prizes.*

has been given to the subject, except in cases where some one who has been called upon to act as judge has formulated a standard for his own use. Some years ago the *New York Poultry Bulletin* published the following scale of points, but it has never been generally adopted:

Eggs	Points
1. Weight	20
2. Freshness	15
3. Color of Yolk	10
4. Flavor	10
5. Consistence of Albumen	10
6. Even Color of Shell	10
7. Thickness of Shell	5
8. Perfection of Outline	5
9. Freedom from Ridges	5
10. Cleanliness	10
	100

At the Boston Poultry Show, January, 1903, Mr. George V Fletcher, who judged the eggs, used a standard of his own devising, as follows:

	Perfection	Cuts
Shape—Large and oval and showing a similarity in size	30	
Color—Very dark brown for brown eggs and very white for white eggs over all the shell	40	
Weight—The heaviest standard and others to be cut one-half point for every ounce under the heaviest	15	
Condition—Fresh laid and perfectly clean	15	
Total	100	

Disqualifications—Double yolk, unsound and cracked eggs.

Commenting on this, *The New York Produce Review* says:

"Of course in formulating a score-card on the point system, the effort should be to allot more or less points to each element of quality according to its relative importance in affecting value. There might be some difference in a proper apportionment of the points according to the use to be made of the scoring. If the score-card were designed for judging fancy hennery eggs sent to a poultry show (when freshness might be taken more or less for granted), it might be proper to lay relatively greater importance on size and color, but even for such use it appears absurd to allot forty points of the 100 to *color* and only fifteen to *freshness;* then it would seem absurd to give *shape* twice as many points as *weight.*

"I suppose it will be a long time before eggs are scored on the point system for regular market grading (if, in fact, they will ever be so graded), but the above attempt suggests the possibility, nevertheless, and it may be

interesting to consider what kind of a scoring basis would be practical. Of the elements of quality we should say that the essentials, placed in the order of their importance in affecting value, would be: First, freshness; second, size; third, cleanness; fourth, packing; and the relative importance of these elements of quality represented in points might be, for freshness fifty points, for size and cleanness twenty points each, for packing ten points."

In our opinion, either of these standards could be very much improved. Inasmuch as it is impossible to test an egg for flavor without destroying it, and no one egg can be taken as representing the flavor of any other, it seems to us that size, color and shape should be the three factors chiefly considered. Minor points would be condition, relating to cleanliness and freshness, and manner of packing—this on the supposition that no one would exhibit a stale egg. If the judging were for market qualities, condition would be counted as fully of as much value as size. However, the matter is yet of very little importance, and is only referred to in this connection that it may suggest some concerted action that will lead to the establishing of a recognized standard by which eggs may be judged uniformly wherever exhibited.

Laying Qualities of Breeds

The laying qualities of some of the breeds of fowls kept in this country have been already referred to. When we begin the discussion of this point we are well aware that we are on dangerous ground for two reasons: 1. Each breed and variety has its champions among the many poultry breeders of the country, and no champion is willing to acknowledge that his breed can be beaten by any other. 2. There has been so little done in the way of keeping accurate account of the actual production of eggs by the different breeds that it is not possible to give exact figures except in a few cases.

The experiment stations of the country have not been greatly interested in this phase of the subject and have given but little attention to it. A good many reports have been made by poultry keepers, but most of these lack in some respect and cannot be put forward as tests that have been so carefully made as to be accorded a place as records on which to base positive statements. We hear about flocks that will average 200 eggs per year for each hen in them, but we have abundant reasons for thinking these are more in the nature of guesses than actual accounts carefully kept.

It is usually believed that the Hamburgs are the most persistent layers of any breed commonly kept, but as far as we have been able to learn

PRIZE-WINNING PLYMOUTH ROCK COCKEREL

Owned by E. M. Gill, New York

(Second at New York Poultry Show in 1903)

there is not a single record upon which to base a belief of this kind. The Hamburgs are no doubt good layers, but they do not lay in cold weather, and it is probable that their persistent laying during the summer, when the larger breeds are inclined to sit, gave them their reputation for prolificacy. The Hamburgs were never very popular in this country, and it is probable that fewer of them are now bred than was the case a few years ago.

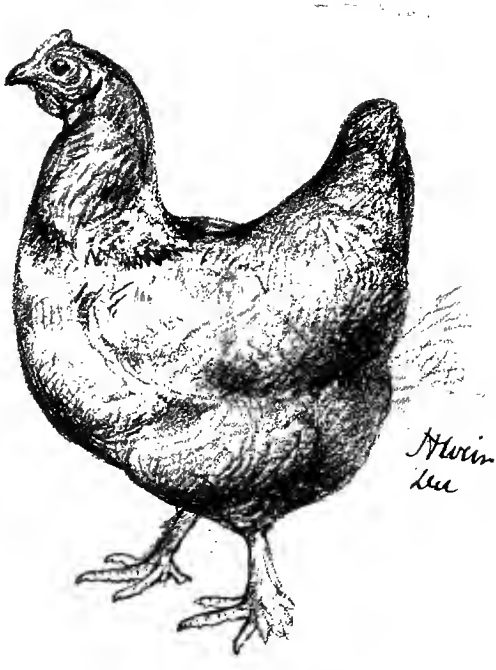
The Mediterranean class is highly esteemed for its laying qualities and is steadily becoming more popular with those who make the production of eggs a special feature. This class includes the several varieties of Leghorns, the Minorcas, the Anconas and the Black Spanish. All of these are good layers, and the laying qualities of the breeds are steadily being improved through the careful attention of egg-farmers. The White Leghorn is the most popular variety in this entire class, and a large number of the great egg-farms of this country are stocked with White Leghorns exclusively. This is especially true of the great egg-farms of New York and those around Petaluma, California, where there are very few flocks of any other variety.

Next to the Mediterranean class comes the American class, which includes the Plymouth Rocks, the Wyandottes in all their varieties, the Javas and the American Dominiques. These are usually called general-purpose fowls, but recent attempts at improving their egg-producing qualities have succeeded to such an extent that the Wyandottes promise to become known as a very prolific breed.

The Orpingtons have not been bred long enough in this country to establish their qualities, but from reports that come from breeders they seem to be a promising breed for the production of eggs. As they are a new breed, in which there is a Hamburg cross, it is probable that they will prove to be among our best layers and possibly take first place among the larger breeds.

Among the Asiatic breeds, which include Brahmas, Cochins and Langshans, the latter are generally most highly esteemed as egg-producers, the Light Brahmas coming next and the Cochins considerably below these.

The Dorkings, the French and Polish breeds are not highly esteemed, although the Houdans are fairly prolific, laying a large white egg. However, they are not classed among the most popular fowls in this country. The Andalusians and the Minorcas are both fairly good layers, and some strains of each breed are among the best, and great pains are being



LANGSHAN PULLET
Bred by Harrison Weir—Third generation from imported birds

taken to improve them in this respect. Statements are frequently found in the newspapers ostensibly giving the number of eggs produced per annum by the different breeds, but, as we have said, these are simply guesses, and in almost every instance where careful records have been kept it has been found that exceptionally good layers and very poor ones may be found in the same breed.

Light Brahma hens have been known to lay more than 230 eggs in a year, and where good care and proper attention to kind and quality of feed is given this breed is no doubt a very good one for the production of eggs. The writer has known a flock of Single Comb Brown Leghorns to lay an average of 179 eggs each in a year, but this flock was given every attention.

At the Maine Experiment Station 126 Plymouth Rock hens were tested for one year, after they first began laying. Of these, 24 produced from 160 to 206 eggs, but three making a record above 200. Of the same flock there were 22 hens that failed to lay as many as 100 eggs during the first year after beginning to lay. Some of this flock made a record as low as 36 eggs during the year.

At the same time 56 White Wyandottes were tested and 9 were found that laid from 165 to 208 eggs in a year, 3 laying 200 or more. Of this flock 7 laid fewer than 100 eggs, the lowest record being 59. Of 56 Light Brahmas tested in connection with the two flocks above referred to, 6 laid from 179 to 194 eggs in a year, 5 laid fewer than 100, ranging from 55 to 87, and 45 from 100 to 160 each.

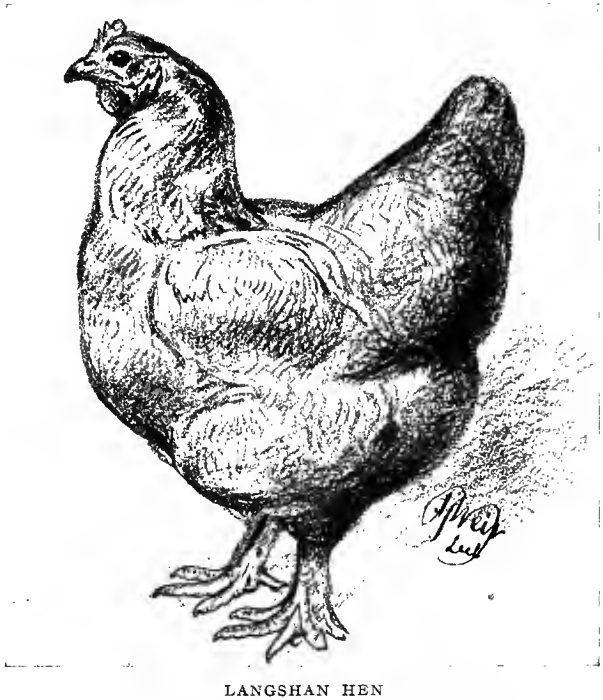
The *Farmers' Sentinel* for February 12, 1903, gives an account of a flock of White Leghorns numbering 900 that averaged 197 eggs each during one year, but gives no information as to how the record of this flock was kept.

It is conceded that if the best hens in any flock were selected year after year and used for perpetuating the flock there would be a rapid and marked improvement in the yield of the flocks of the country.

Influence of Feeds

Some experiments at the West Virginia Experiment Station proved that the feed provided for laying hens makes a great difference in their production of eggs. These experiments showed that a nitrogenous ration promoted egg-production to a remarkable degree. The fowls used were as nearly identical in age as possible, and all the conditions were exactly the same in caring for the two lots except in the quality of the feed provided for them.

Both lots were fed in the morning with ground feed mixed either with boiled potatoes or steamed clover hay. The carbonaceous lot were fed principally on corn in the shape of meal, while the nitrogenous lot were fed a mixture of brown middlings, oil meal and ground oats and corn-meal in varying proportions, for their grain ration. At noon the nitrogenous lot received a feed of ground fresh meat at the rate of from five to eight pounds to the 100 birds. At night the fowls in both flocks were fed all the whole grain they would eat up



LANGSHAN HEN
Bred by Harrison Weir—Third generation from imported birds

clean, consisting of corn, oats and wheat screenings, corn predominating for the carbonaceous lot.

At the beginning of the experiment the fowls were weighed. The experiment continued for seven consecutive months, and during that time the nitrogenous fowls gained in weight about one pound four ounces each, while the gain in weight for the carbonaceous lot was only about one-tenth of a pound each.

In this experiment one pen each of Light Brahmas, White Leghorns and Rhode Island Reds were used for each kind of feed. At the end of the seven months the nitrogenous-fed fowls had produced eggs as follows: White Leghorns, 72.03 each; Light Brahmas, 40.41 each; Rhode Island Reds, 62.15 each. The carbonaceous-fed fowls had produced eggs as follows: White Leghorns, 33.92 each; Light Brahmas, 22.74 each; Rhode Island Reds, 40.42 each.

During the seven months the nitrogenous-fed pens, calculating 100 hens to the pen, laid 17,459 eggs, and the carbonaceous-fed pens 9,708 eggs. Thus it will be seen that the nitrogenous feed not only added to the weight of the hens, but stimulated them to produce nearly twice as many eggs as were produced by the carbonaceous-fed hens. The value of the eggs produced was as $194.84 to $119.06 in favor of nitrogenous feed.

Allowing market price for added weight and eggs produced, the three pens fed on nitrogenous feed yielded a profit above cost of feed, during the seven months, of $97.90, while the profit from those fed on carbonaceous feed was but $20.59. As the experiment began in October and was continued through the winter, the egg-production was very good.

In every case the eggs from nitrogenous-fed hens were heavier than those from the hens fed on a carbonaceous ration, the difference averaging a little over one pound to 100 eggs. Incubation tests showed that the nitrogenous-fed hens produced better eggs for hatching than the carbonaceous-fed lots. Of two lots of eggs, one from hens fed on each kind of feed, the nitrogenous-fed eggs showed 65 infertile, the carbonaceous-fed 129. Of the nitrogenous lot 260 hatched, and of the carbonaceous lot but 146. Sixty-six per cent. of the nitrogenous eggs hatched and but 47 per cent. of the carbonaceous lot.

It was found that eggs from nitrogenous-fed hens hatched about twelve hours the sooner and that the chicks were stronger than those from eggs laid by carbonaceous-fed hens. These experiments were repeated the next year with almost identical results, showing the importance of proper feed in the production of eggs in numbers and in their quality when used for hatching.

One curious result of the different kinds of feed was noticed. The shells of the Light Brahmas fed on nitrogenous feed were pinkish in color, while those fed on carbonaceous feed were of various shades of brown.

Laying Capacity of Breeds

In Bulletin 29, United States Department of Agriculture, Mr. T. F McGrew gives the following as the average egg-production in the breeds named under the very best management: Barred Plymouth Rocks, 150 per year; Buff Plymouth Rocks, 150; Single Comb Brown Leghorns, 160; Single Comb 160; Silver Wyandottes 160; Buff Leghorns, Wyandottes and White Island Reds, 150.

BLACK HAMBURG HEN
James Long's first prize

In *The Business Hen*, Rural Publishing Company, New York, 1892, page 57, C. E. Chapman, a well-known writer on poultry subjects, says he visited a flock of White Leghorns numbering 600 which produced an average of 168 eggs each in one year. As he gives quite full details, this is probably approximately correct for that flock. The writer visited the same flock in 1902 and found descendants of the fowls Mr. Chapman described ten years before, and was led to believe the flock had been improved since that time.

We may safely take it for granted that it would not be a hard matter to breed a flock of fowls of any of the popular breeds that would average 150 eggs per year, and by careful selection and the use of trapnests this yield could without doubt be increased one-third.

Taking the census returns, which show an average of about five dozen eggs per hen, it is readily seen that there is abundant

room for improvement in the matter of egg-production in the flocks of this country.

It is noticeable that in every contest that has been held, and in every experiment public or private, it has been pure-bred hens that have excelled as layers. The ordinary mongrel stock of the country does not make large egg records. In fact, it is altogether probable that the average "native" or cross-bred hen is kept at a very small profit at the best, and often at a positive loss.

The importance of keeping pure-bred fowls is becoming better understood all the time, and the proportion of mongrels is growing smaller constantly. This is shown when we compare the census reports of 1890 with those of 1900, the average production of eggs per hen during that time having increased about 100 per cent.

It has repeatedly been shown that the most profitable year of a hen's life is the year after she first begins to lay. There has been considerable speculation as to the number of eggs it is possible for a hen to produce during her lifetime, and some investigators have placed the number as high as 600, estimating that these would be produced during nine years.

The modern poultryman cares nothing about the possible number of eggs a hen can produce. What he cares most for is the profitable number, and the general rule of egg-farmers now is to sell the hens at the end of the first year after they begin laying, say at about the age of eighteen months, having pullets coming forward to take their places. Where this rule is practiced every effort is made to promote early maturity, strong, vigorous growth and the greatest possible egg-production.

As older hens produce the best eggs for hatching, it is common to reserve enough stock to furnish eggs for hatching from birds two years old, but this will require a comparatively small number, and the rule of keeping only pullets for egg-laying holds good. No doubt the low average production shown by the census reports is due in some measure to the fact that many farmers keep their hens year after year until many of them have ceased to lay more than a few eggs each season.

The natural time in the year for a hen to lay is during the spring and summer. The original Jungle Fowl laid twenty or thirty eggs, hatched her brood and reared them, and her work for the year was done. Under the influence of domestication the laying period has been extended to nine or ten months of the year, the average hen laying some eggs during every

month in the year except during the molting period, or while incubating and brooding her young.

It is usual for hens to fail to produce eggs during the period of molting, although good layers will produce an egg occasionally even while taking on a new suit of plumage. Usually it requires about three months for a hen to molt and resume laying regularly. This leaves about nine months in the year as the period of possible egg-production. In the case of the Wyandotte hens we have referred to which produced 200 eggs in a year, it will be seen that in the space of nine months they produced eggs to the extent of about four times their own weight, as the *American Standard of Perfection* fixes the weight of a Wyandotte hen at six and one-half pounds, and when in full laying condition they rarely reach this weight.

Winter Egg-Production

It makes considerable difference to the poultryman whether his hens produce eggs freely in winter or not. During the winter eggs are usually three or four times the price they can be sold for during the summer, and it follows that the winter-laying hen is the most profitable one to keep. Therefore, during the last few years much attention has been given to promoting egg-production in the winter months. The Langshans, the Plymouth Rocks, the Light Brahmas and the Wyandottes are more inclined to lay in winter than any other breeds, and will produce a few eggs during this season without having extra care.

The noted laying breeds, such as the Leghorns, Minorcas, Andalusians and Hamburgs, are naturally somewhat sensitive to cold, and to induce them to lay during the winter they must be given the best care and properly prepared rations.

It is now very well understood that in order to promote the production of eggs beyond the normal number hens must be fed such feeds as contain the elements of which eggs are composed. The large percentage of albumen in the composition of an egg indicates the necessity of a ration rich in nitrogenous elements, while for the fats in the yolks the need of carbonaceous feeds is indicated.

Animal feed of any kind is rich in the albuminoids, and the leguminous plants are also among the nitrogenous feeds. This led to careful experiments in feeding fresh bone, ground fine, butchers' scraps from which the fat had been removed, and finally to dried and ground beef scraps so

prepared that but little fat was left in them. These are now sold almost everywhere, so prepared that they will remain fresh and sweet for an indefinite time if kept dry.

Peas, beans, clover-hay cut in very short lengths or ground into a meal are also used—the cut or ground clover in very large quantities, large factories being operated to supply the demand for it, and several large factories are engaged in making dried and ground beef scraps for poultry feed. Dried blood is also esteemed as an exceptionally good egg-food. Green vegetables, such as cabbages and any of the root crops, are used to furnish vegetable feed of a succulent nature, which has been found to promote the production of eggs.

By providing warm houses, well lighted and kept in a sanitary condition, and feeding these special feeds in addition to the ordinary grains grown on the farm, it is now quite possible to stimulate the hens and furnish conditions so nearly natural to the normal period of laying that many flocks produce eggs freely during the severest weather of the year.

At the West Virginia Experiment Station two flocks identical in every respect were fed the same kind of feed and given the same care except that one flock was kept in a cold house and the other in a house that was perfectly warm and comfortable. The flock kept in the cold house laid 4,136 eggs, while the flock kept in the warm house laid 5,239, a difference in favor of the warm house of 1,103 eggs, worth at the time the experiment was made $22.06. This is only one of many experiments that have been made along the same line, and in every case the results have agreed with those obtained in this one.

Cost of Egg-Production

Some interesting experiments have been made to determine the cost of producing eggs. Unfortunately, in all these experiments the items of interest on investment, depreciation of plant and cost of labor was not considered. Therefore the results have shown only the feed-cost. The writer kept careful account with a flock of Single Comb Brown Leghorns for one year and found the feed-cost of the eggs produced by this flock was almost exactly 5.25 cents per dozen.

In a prize competition made under the auspices of the *Ohio Farmer* several years ago the writer was selected to award the prizes. Seventy-two flocks were in the competition, and this lasted from May 1st to November 1st. The cost of the eggs produced by these flocks during the period of the tests was almost exactly six cents a dozen.

The Canadian Department of Agriculture asked of a large number of poultry breeders the cost of eggs to them, and the replies indicated that between five and six cents a dozen was the average feed-cost in the Dominion of Canada. From December 1, 1901, to March 29, 1902, a period of seventeen weeks, the New York Experiment Station at Ithaca, in that State, conducted an experiment in which ten of the best-known poultrymen of New York kept account with their flocks, each feeding in his own way. There were 12 flocks on the 10 farms, ranging in number from 25 to 600, the aggregate being 2,133 hens. The average feed-cost of a dozen eggs during this time was 16.3 cents, the lowest being 8.7 cents for a flock of White Leghorns and the highest being 33.9 cents for a flock of Black Minorcas. It should be remembered that this test was made during the most unfavorable time in the year.

Selling Eggs by Count or Weight

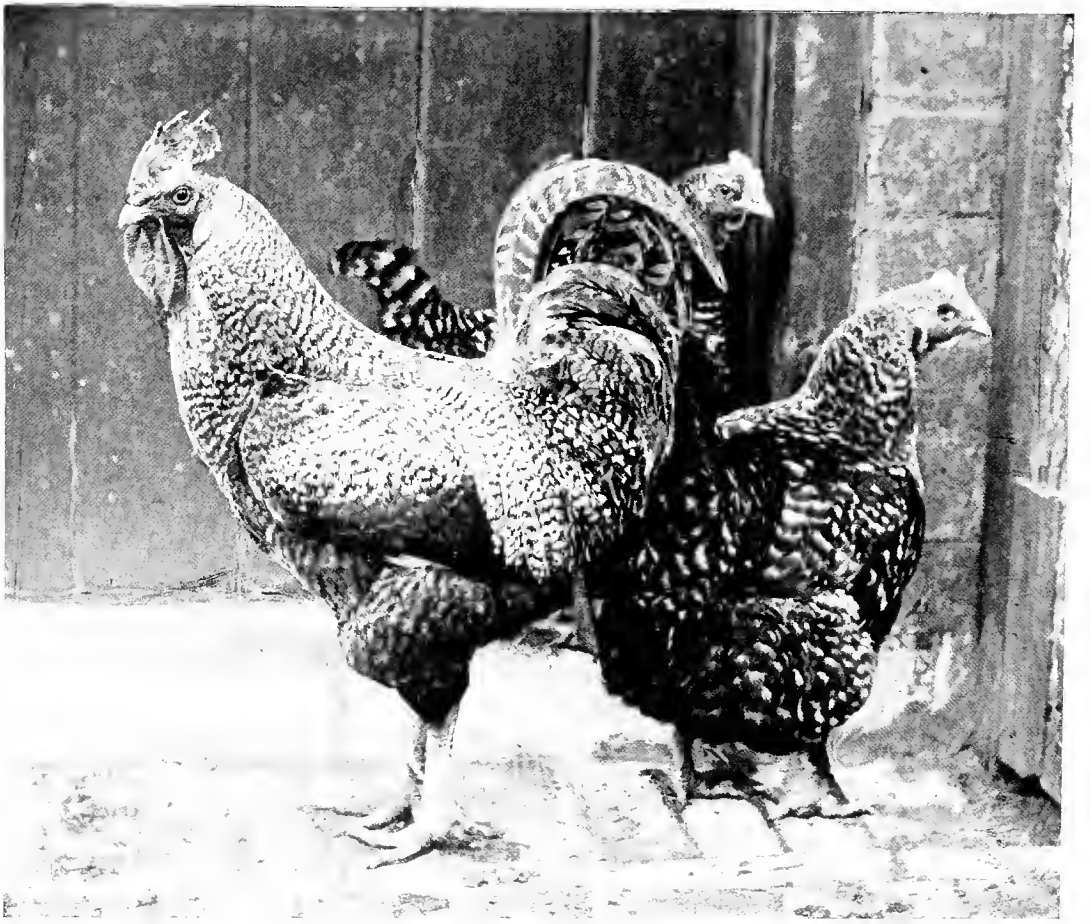
The universal custom of selling eggs by count cannot be explained on any logical ground. It is a remarkable example of the persistence of an old custom, inaugurated when the eggs of the country varied very slightly in size and weight. In buying any other commodity the price is regulated by some fixed standard, and a certain weight or measure is used by which the cost is fixed and made uniform. Eggs, whether large or small, are

SHANGHAI OR COCHIN HEN
Middle Period type

sold by count, and the only unit by which the cost is fixed is the dozen or, in England, the score. Whether the eggs are from Hamburgs and weigh twenty-one ounces to the dozen, or from Minorcas and weigh thirty ounces to the dozen, the price is the same if the two varieties are offered in the same market at the same time. It is manifestly unjust that this custom should prevail, for the breeder of Minorcas furnishes 50 per cent. more food when he sells a dozen eggs from his fowls than is the case with the breeder of Hamburgs.

The North Carolina Experiment Station took this matter up and has published some interesting notes concerning it. The eggs of a number of breeds of hens and pullets and of Pekin Ducks were carefully weighed and their comparative value computed. As a rule, the eggs of hens were larger than the eggs of pullets of the same breed. The eggs of Pekin Ducks were considerably larger than the eggs of any breed of hens. These duck eggs averaged, taking those from old and young ducks together, 35.6 ounces per dozen. The largest eggs of any breed of hens were those of the Light Brahma, these weighing 28 ounces to the dozen. Eggs laid by Barred Plymouth Rocks and Black Langshans weighed a trifle more than 26 ounces per dozen; Brown Leghorn, late hatched Plymouth Rock, White Wyandotte and Buff Cochin eggs weighed from 21.7 to 23.7 ounces per dozen. The heaviest pullet eggs were those of Black Minorcas, which weighed 26.5 ounces per dozen. The lightest pullet eggs were laid by Single Comb Brown Leghorn and Silver Wyandotte pullets, these weighing 17.5 and 22.1 ounces per dozen respectively. The eggs of Barred Plymouth Rock, White Plymouth Rock, White Wyandotte, Black Langshan and Buff Cochin pullets weighed not far from 24 ounces per dozen.

All these eggs were worth in the local market, at the time the matter was being investigated, 13½ cents a dozen. Taking the eggs of the Single Comb Brown Leghorn pullets, which were the lightest, as the basis of comparison, we can easily compute the value of those of heavier weight. The Brown Leghorn eggs weighed 17.5 ounces per dozen, and at 13½ cents per dozen were worth almost exactly 12 cents a pound. This would make the eggs from Brown Leghorn hens, weighing 21.7 ounces per dozen, worth 16.3 cents per dozen, and those from Light Brahma hens worth 20.7 cents per dozen, or about 60 per cent. more than the price the market afforded for them.



SCOTCH GREY FOWLS

The following tables from *Farm-Poultry*, January 1, 1900, give the breeds investigated, the number of eggs weighed, the weight per dozen and the comparative value per dozen, all arranged to show at a glance the injustice done to some breeds by selling eggs by the count.

COMPARATIVE VALUE OF EGGS BY WEIGHT AND PER DOZEN

	No. of eggs laid	Weight per doz. oz.
Barred P. Rock hens	402	26.3
Barred P. Rock hens (late hatched)	554	23.5
Barred P. Rock pullets	506	24.2
White P. Rock pullets	478	23.6
White Wyandotte hens	232	23.5
White Wyandotte pullets	689	23.6
S. L. Wyandotte pullets	613	22.1
S. C. Brown Leghorn hens	535	21.7
S. C. Br. Leghorn pullets	623	17.5
Black Minorca pullets	354	26.5
Black Langshan hens	463	26.5
Black Langshan pullets	827	24.1
Buff Cochin hens	518	23.7
Buff Cochin pullets	83	23.4
Light Brahma hens	118	28
Light Brahma pullets	412	23.4
[illegible] ung	448	35.6

	Cents	Percentage above market value
S. C. Br. Leghorn pullets	13.5	
S. C. Br. Leghorn hens	16.3	20.7
S. L. Wyandotte pullets	16.6	23
Light Brahma pullets	17.54	30
Barred P. Rock Hens (late hatched)	17.6	30.4
White Wyandotte hens	17.6	30.4
White Wyandotte pullets	17.7	30.4
White P. Rock pullets	17.7	31.1
Buff Cochin hens	17.8	31.8
Black Langshan pullets	17.8	31.8
Barred P. Rock pullets	18.2	34.8
Barred P. Rock hens	19.7	46
Buff Cochin pullets	19.9	47.2
Black Langshan pullets	19.9	47.2
Black Minorca pullets	19.9	47.2
Black Langshan hens	20.44	51.4
Light Brahma hens	21 6	60
Pekin ducks	26.7	97.8

Until it becomes customary to sell eggs by weight there will be no incentive for the poultryman to undertake to increase the size of eggs. Indeed, it is to his advantage under the present custom to produce small eggs, for they can be produced at less cost. At the Maine Station it was found that increasing the number of eggs laid by a flock of hens reduced the size of them to a marked degree.

VALUE AS FOOD

A discussion of this subject would not be complete if we were to omit reference to the value of eggs as an article of diet and showing how they compare with other common articles of food. The following table shows the average composition of eggs, egg products, and other common articles of food. It was prepared by Doctor C. F. Langworthy for the United States Department of Agriculture:

AVERAGE COMPOSITION OF EGGS, EGG PRODUCTS, AND CERTAIN OTHER FOODS

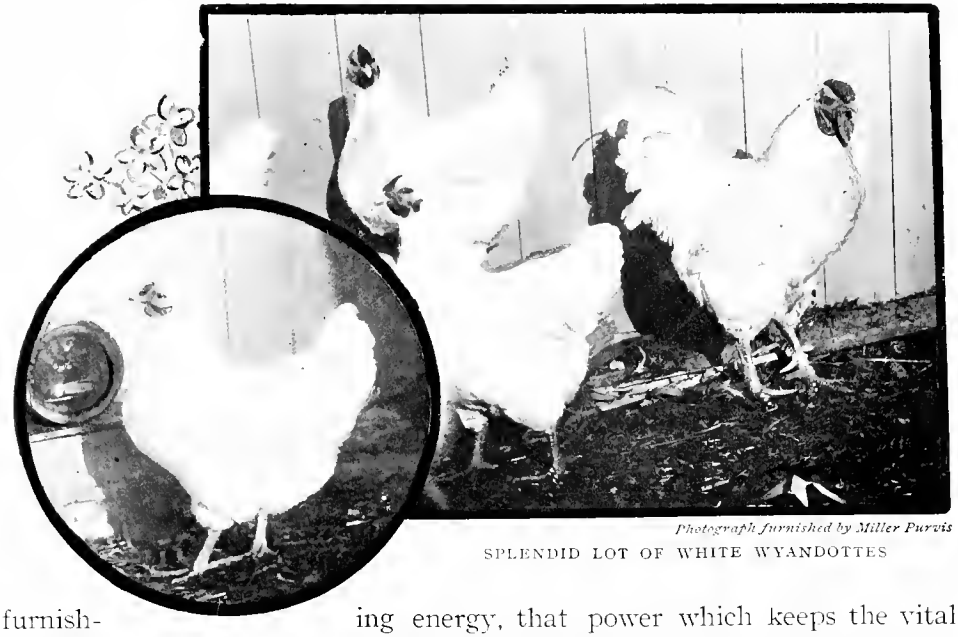
	Refuse	Water	Protein	Fat	Carbo-hydrates	Ash	Fuel value per pound
Hen:	*Per Cent.*	*Per Cent.*	*Per Cent.*	*Per Cent.*	*Per Cent.*	*Per Cent.*	*Calories*
Whole egg as purchased	11.2	65.5	11.9	9.3	....	.9	635
Whole egg, edible portion	....	73.7	13.4	10.5	....	1.0	720
White	....	86.2	12.3	.2	....	.6	250
Yolk	....	49.5	15.7	33.3	....	1.1	1,705
Whole egg boiled, edible portion	....	73.3	13.2	12	....	.8	765
White-shelled eggs as purchased	10.7	65.6	11.8	10.8	....	.6	675
Brown-shelled eggs as purchased	10.9	64.8	11.9	11.2	....	.7	695
Duck:							
Whole egg as purchased	13.7	60.8	12.1	12.5	....	.8	750
Whole egg, edible portion	....	70.5	13.3	14.5	....	1.0	860
White	....	87.0	11.1	.03	....	.8	210
Yolk	....	45.8	16.8	36.2	....	1.2	1,840
Goose:							
Whole egg as purchased	14.2	59.7	12.9	12.3	....	.9	760
Whole egg, edible portion	....	69.5	13.8	14.4	....	1	865
White	....	86.3	11.6	.02	....	.8	215
Yolk	....	44.1	17.3	36.2	....	1.3	1,850
Turkey:							
Whole egg as purchased	13.8	63.5	12.2	9.7	....	.8	635
Whole egg, edible portion	....	73.7	13.4	11.2	....	.9	720
White	....	86.7	11.5	.03	....	.8	215
Yolk	....	48.3	17.4	32.9	....	1.2	1,710
Guinea-fowl:							
Whole egg as purchased	16.9	60.5	11.9	9.9	....	.8	640
Whole egg, edible portion	....	72.8	13.5	12	....	.9	755
White	....	86.6	11.6	.03	....	.8	215
Yolk	....	49.7	16.7	31.8	....	1.2	1,655
Plover:							
Whole egg as purchased *a*	9.6	67.3	9.7	10.6	....	.9	625
Whole egg, edible portion *a*	....	74.4	10.7	11.7	....	1	695
Evaporated hens' eggs	....	6.4	46.9	36	7.1	3.6	2,525
Egg substitute	....	11.4	73.9	.3	5.3	9.1	1,480
Pudding (custard) powder *a*	....	13	2.1	3.4	80.9	.6	1,690
Cheese as purchased	....	34.2	25.9	33.7	2.4	3.8	1,950
Sirloin steak as purchased	12.8	54	16.5	16.1	....	.9	985
Sirloin steak, edible portion	....	61.9	18.9	18.5	....	1	1,130
Milk	....	87	3.3	4	5	.7	325
Oysters in shell as purchased	81.4	16.1	1.2	.2	.7	.4	45
Oysters, edible portion	....	86.9	6.2	1.2	3.7	2	235
Wheat flour	....	12.0	11.4	1	75.1	.5	1,650
Potatoes as purchased	20	62.6	1.8	.1	14.7	.8	310
Potatoes, edible portion	....	78.3	2.2	.1	18.4	1	385

a European Analyses

The above reports of analyses show that eggs consist chiefly of two nutrients—protein and fat—in addition to water and mineral matters represented by the ash contents as given in the table. Usually it is stated that

eggs are entirely deficient in carbohydrates, but strictly speaking this is not true. They contain a trace of carbohydrates, but so small is the quantity that it is negligible for all practical purposes.

The protein is that element which builds up the muscles, skin, hair, nerves, brain, viscera, bones and tissues generally. The fat is useful in



Photograph furnished by Miller Purvis

SPLENDID LOT OF WHITE WYANDOTTES

furnishing energy, that power which keeps the vital spark burning and enables us to live and move. Some energy is also derived from protein, and in case carbohydrates or fat is lacking protein supplies all of the energy.

As eggs are deficient in fat, it will be seen that the common custom of combining eggs with bacon or ham is an effort to balance the food, unconsciously though it may be made. The potential energy of fat is about 2.4 that of carbohydrates, and the use of bacon with eggs makes a very fairly balanced food.

In composition eggs resemble such foods as meat, milk and cheese much more than they do any of the vegetables. In nutritive value eggs stand between cheese and milk or oysters. They very closely resemble average meat in composition. From the chemical composition they are shown to belong to the same class as other animal foods, and may take the place of them.

Elaborate experiments both in this country and Europe have demonstrated that eggs are equally digestible with other foods of their class and that they are more thoroughly digested than most foods of similar composition. In conducting dietary studies it has been found that eggs at 12 cents a dozen were a cheap food, at 16 cents they were fairly expensive, and at 25 cents they were considered very expensive.

It is frequently said that eggs at 25 cents a dozen are cheaper than beef. This is true in one respect. For a family of five it would require at least one and one-fourth pounds of beef, costing 25 cents, while in most families five eggs costing approximately 10 cents would satisfy the appetite as well and serve exactly the same purpose. Even if the family would eat two eggs apiece, the saving would be 20 per cent.

During a dietary study at Lake Erie College made by Miss Bevier, now of the Illinois College of Agriculture, and Miss Sprague, it was found in boarding a club of young ladies that eggs costing $2.50, when selling at 16⅔ cents per dozen, took the place of beefsteak costing $6.12, the beefsteak costing 17 cents per pound: that is, ten dozen eggs would take the place of thirty-six pounds of beefsteak. However, it is not to be understood in this case that the eggs were a perfect and complete substitute for the beefsteak as far as nutritive value was concerned, for no account was made of the nutrients in the other foods consumed at the same meals. The eggs merely supplied and satisfied the appetite as far as animal food was needed much more cheaply than this could have been done if beefsteak had been used in their place.

Palatability has much to do with the value of foods, although why this is so is not well understood. Eggs are relished by almost every one, old and young, while meats are rejected by a good many people. For this reason eggs may sometimes be used when meats would not be available. Occasionally a person will be found who is made ill by eating eggs. Such cases are no doubt due to some individual predisposition or idiosyncrasy, as it is not rare to find those who cannot eat certain articles of diet in common use.

Medical literature contains very few cases of poisoning from eating eggs, so the danger from this source is very remote. Commonly such cases are due to ptomaine poisoning induced by eating eggs that are stale. In these days of sanitary precautions common prudence would point out the necessity of providing clean nests and clean runs and houses for laying hens.

The Preservation of Eggs

Much time has been expended and many different processes tried in efforts to discover some method of preserving eggs for an indefinite time. Although it is generally conceded that no process is yet in use that will preserve eggs for a very long time, keeping them in perfect condition, yet we constantly see in the public press announcements of the discovery of some wonderful preparation by which eggs can be preserved for a term of years, remaining perfectly good in every respect.

As a matter of fact, those who have given this matter the most attention are quite generally agreed that the preserving of eggs for an indefinite time is beyond the range of possibilities. They argue that any process that would preserve the eggs from gradual deterioration, if not actual decay, would necessarily render them unfit for food, and that to undertake to preserve eggs fresh and sound is impossible.

So far, cold storage in specially prepared buildings is the best means of preserving eggs in even tolerable condition for as long as a year. Usually eggs are not stored more than a few months at the longest. It is a well-known fact that eggs kept in cold storage lose flavor and deteriorate to such a marked degree that one accustomed to eating perfectly fresh eggs will detect them at once when put before him on the table.

Many times eggs that have been kept in cold storage take on a peculiar musty taste that makes them unpalatable to those who have been accustomed to fresh eggs, and the best of cold-storage eggs lose that appetizing flavor found in new-laid eggs. For culinary purposes, such as making cakes and other made dishes, cold-storage eggs are frequently almost as good as new-laid ones, but after they have been stored from April, the usual time for putting them in storage, until December or later, they lose much of their palatability when cooked alone.

The keeping of eggs in cold storage has been treated in the chapter devoted to "Commercial Eggs" (see Part I), and need not again be taken up in this connection. Many solutions have been tried as egg-preservatives, and many of them have proved fairly efficacious when the eggs were to be kept only a few months.

When it is desired to preserve a small number of eggs for family use, or even to supply a limited local demand, there are several solutions that will answer quite well for this purpose. These do not require expensive apparatus or special buildings, and are adapted to the use of those who

Photograph by C. Reid, Wishaw, N. B.

YOUNG SILVER BLACK-LACED WYANDOTTE

want to preserve eggs from the time when they are plentiful until the time when they become scarce.

Before considering solutions it might be well to note the most favorable conditions under which eggs can be preserved. They should be from hens that have no males running with them, as an infertile egg keeps longer, even without the use of a preservative, than does a fertile one. The reason for this is that an infertile egg does not contain the life principle. It is merely an inert and dead combination of substances provided by nature for the support of the embryo chick during the process of incubation.

When an egg has become fertilized it contains a minute germ which is alive and under proper conditions is capable of growing into a perfect chick. This cell or germ is alive as long as the egg remains fit for food, for when it dies the process of disintegration that sets in in the germ communicates the elements of decay to the remainder of the egg.

It should be remembered that the contents of the egg-shell are not to be confounded with the chick that may be hatched from the egg. In fact, the embryo, the microscopic speck of protoplasm in which the life principle resides and is preserved, in a fertile egg, bears exactly the same relation to the other contents of the egg-shell that the loaf of bread in a baker's window bears to the man who purchases and eats it. The contents of the egg-shell are the food on which the embryo grows and matures into a perfect chick. The processes by which this cell grows into a perfect chick may not properly be taken up in this chapter, but it is an exceedingly complicated and interesting one, and one who studies it comes as near

to seeing the beginning of life as he could in studying any other phase of animate existence.

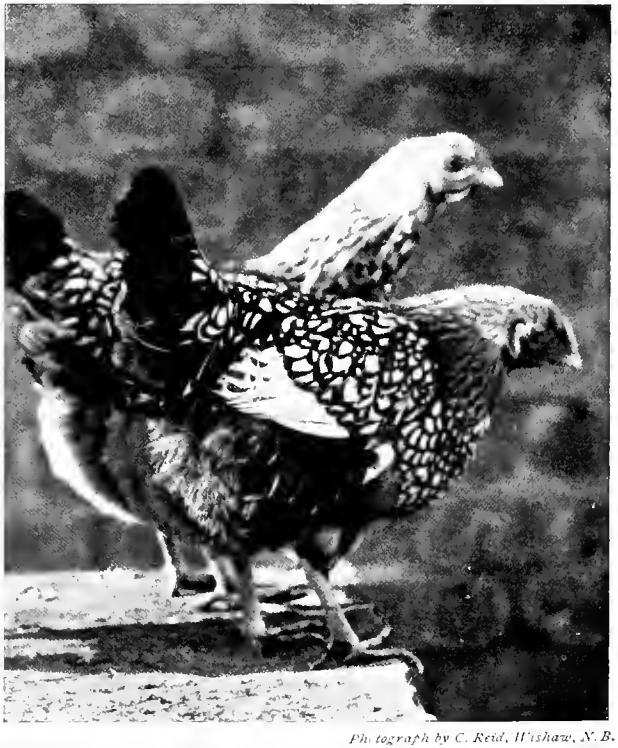
If this life principle is not present in an egg the tendency to decay and the disassociation of the elements contained in it are considerably retarded. This is proved in the case of infertile eggs placed in an incubator. At the end of three weeks there is no change in them that can be observed, either as to condition or flavor. Except for the natural prejudice that exists against such a course, an infertile egg that has been in an incubator for three weeks is exactly as good as it would have been if it had been left on the outside. But if there has been a life germ in the egg, no matter how weak it may have been, even if it should have lived but a day after incubation had begun, the egg containing it decays and the contents become very offensive in appearance and smell.

For this reason infertile eggs should be selected when they are to be preserved. These eggs should be perfectly fresh, also, for it has been found that unless fresh eggs are used the deterioration is marked, and if an egg in which decay has set in is placed in the same vessel with others it is likely to injuriously affect all the surrounding ones.

The eggs that are to be preserved should be clean, as filth of any kind clinging to the shells is likely to taint the preserving solution and thus taint the eggs in it.

No cracked eggs should be placed with sound ones, and great care should be taken not to crack them when putting them in the solution.

Eggs that are in a



Photograph by C. Reid, Wishaw, N.B.

SILVER BLACK-LACED WYANDOTTES

preservative solution should be kept in a moderately cool room, a dry, clean cellar preferably, as the temperature should be kept as nearly constant as possible with ordinary good care.

It has been found that identical solutions did not act in the same manner in different places, and it may be said they showed different results at times in each experiment made. For instance, the same processes used in Montana, Ottawa, Canada, and Berlin, Germany, gave different degrees of satisfaction. The Canadian experiments, continued through several years, did not exactly agree with a very careful series of experiments made at the Montana Experiment Station.

As many processes are recommended and advertised for sale, it might be well to recount some of the failures as well as the successes. In the Montana experiments two solutions were used, as follows:

1. Lime, $3\frac{1}{2}$ pounds; salt, $4\frac{3}{4}$ pounds; water, 8 gallons.
2. Water-glass, 1 part; water, 18 parts.

About sixty dozen eggs were put in each solution and the experiment was continued for six months. When examined the water-glass was found to be the best pickle, although the lime solution served its purpose very well. The whites of the eggs preserved in the lime-and-salt solution were found to be much more watery than was the case with those kept in the water-glass solution.

Those kept in the water-glass were difficult to distinguish from perfectly fresh eggs, as the white was quite firm and the yolk stood up upon it just as it does in a fresh egg.

Another advantage of the water-glass solution is that it does not affect the shell, as is the case where the lime solution is used. Eggs from the lime-and-salt solution were found to be very liable to crack either from handling or when cooking.

Water-glass or soluble glass is sodium silicate or potassium silicate, the commercial article frequently containing both. It is not necessary to use the chemically pure product, the ordinary commercial water-glass being sufficiently pure, unless it is adulterated. Sometimes it is strongly alkaline, and this should not be used. It can be bought of almost any druggist. In Montana it costs about 75 cents a gallon. Usually the price runs from $1\frac{3}{4}$ cents a pound in carboys to 10 cents a pound in small lots. It comes either as a smooth, slippery, sirupy liquid or in powders. The liquid form is preferable. Only pure water should be used in making the mixture,

and it is best to boil it and let it cool before using. Earthen jars are recommended to hold the solution, and these should be perfectly clean. If kegs or other wooden vessels are used they should be very thoroughly scalded and cleaned before being used. Sometimes the specific gravity of the solution is greater than that of the eggs. When they float to the top from this cause they should be weighted down to keep them entirely immersed.

At the Central Experiment Farms, Ottawa, Canada, Frank T. Shutt, M. A., conducted a long series of experiments in preserving eggs, with the following results, the eggs having been kept in the different preservatives from May 14th to December 14th, a period of seven months. When examined, the eggs kept in saturated lime-water showed the white somewhat more limpid than in a fresh egg and faintly tinged with yellow. Yolk globular, but in one or two cases attached to the shell. No offensive odor, and appearance, both externally and internally, good. Discoloration of white somewhat more pronounced on poaching, with development of very faint musty odor. Though not equal to a fresh egg, they were quite usable and in no sense offensive.

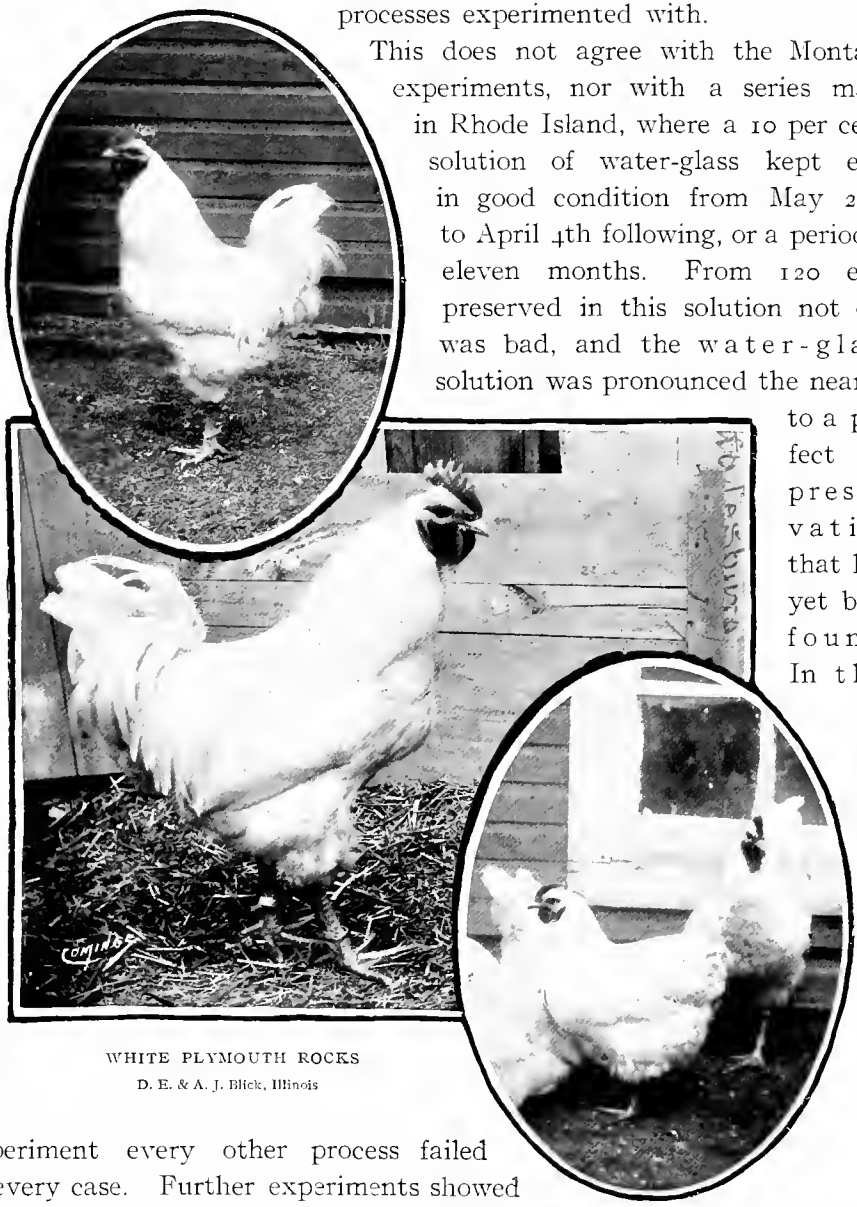
Where saturated lime-water, with the addition of 1 per cent. of salt, was used, the appearance was very good both externally and internally. White very slightly tinged with yellow and somewhat more limpid than in saturated lime-water alone. Yolk, globular; air space, normal. Faint odor, somewhat more marked on poaching. Nothing disagreeable in eggs uncooked or cooked; egg quite usable, but lacking the flavor of a fresh egg. Compared with eggs kept in saturated lime-water alone they were on the whole slightly superior. In eggs kept in saturated lime-water with a 2 per cent. addition of salt the yolk was quite limpid and slightly brownish. They were fairly well preserved, but not equal to either of the foregoing.

Common salt solutions, 1 and 2 per cent. respectively, did not give good results. Eggs smeared in vaseline and then kept in lime-water showed markedly colored white and a decidedly musty odor. Eggs covered with paraffine and kept in lime-water were decidedly inferior. Eggs kept in a 5 per cent. solution of sodium aluminate were fairly good in appearance, but had a musty odor.

Eggs kept in a 2 per cent. solution of water-glass had a marked soapy odor, and, on being poached, a stale flavor.

Mr. Shutt concluded that the saturated solution of lime-water gave the best results and was the cheapest and pleasantest to handle of all the processes experimented with.

This does not agree with the Montana experiments, nor with a series made in Rhode Island, where a 10 per cent. solution of water-glass kept eggs in good condition from May 20th to April 4th following, or a period of eleven months. From 120 eggs preserved in this solution not one was bad, and the water-glass solution was pronounced the nearest to a perfect egg preservative that had yet been found. In this experiment every other process failed in every case. Further experiments showed that a 3 per cent. solution of water-glass was as effective as the one containing 10 per cent. The cost of preserving eggs with this solution



WHITE PLYMOUTH ROCKS
D. E. & A. J. Blick, Illinois

is placed at two-thirds of a cent per dozen, this including the cost of the vessel they were stored in.

An elaborate series of experiments in Germany did not agree with the Canadian experiments, but partially agreed with the Montana and Rhode Island experiments in regard to the value of water-glass in preserving eggs.

Usually preserved eggs do not beat up well and are of little use for making cakes and other similar purposes where they must be whipped. Where they are preserved in water-glass they have been found to beat up or whip as well as fresh eggs.

In view of all the evidence we have been able to get we are inclined to say that the water-glass solution is the best one that has yet been tried.

Eggs for Hatching

The production of eggs for hatching has become of great importance since the advent of pure-bred poultry, and the high value of the eggs makes it necessary to take pains to have them of strong vitality in order to secure good hatches, and to handle them carefully to prevent the destruction of the life principle.

It has been found that eggs from hens that have been stimulated to induce egg-production during the winter do not hatch well, as a rule. No doubt this is due to the low vitality of the hens, they having been exhausted by the long period of production.

Eggs from hens that are too fat or too poor do not hatch well, and it is necessary to provide some means to induce the hens to take exercise in order to have fertile eggs strong in vitality.

Very often a portion of the hens in a breeding flock will not allow the attentions of a male placed with them. To guard against this it is best to have two males with each pen, using each on alternate days.

If the male is active, vigorous and full of life he usually pays more attention to the hens, being too gallant to eat until they are satisfied and no longer hungry, by which time there is nothing left for him, and it is not unusual for a male of this kind to become very thin in flesh, when the hens will no longer produce fertile eggs. This is another argument in favor of isolating the male every other day, as during the rest-day he will eat freely.

Eggs that are to be used for hatching should be gathered several times a day if the weather is at all cold. Eggs have been known to hatch well when left overnight with the temperature down almost to the freezing

point, but it is generally believed that a temperature of 45 degrees F. is as low as is safe for best results.

It is best to set eggs immediately after they are laid. It has been found that eggs set the day they are laid hatch from twenty to thirty hours sooner than those two weeks old when set.

It is not possible always to set eggs immediately, and often they must be kept for several days before they are set. Good hatches are frequently got from such eggs, but it is best to give them good attention from the time they are laid until they are set. They should be kept in an even temperature between 45 and 60 degrees F., if possible, and should be turned over every day. Some poultrymen use a specially designed rack in which the eggs are each held separately with the pointed end down, and at least one such egg rack is so constructed that the shelves on which the eggs are held may be turned so as to turn the eggs as frequently as desired.

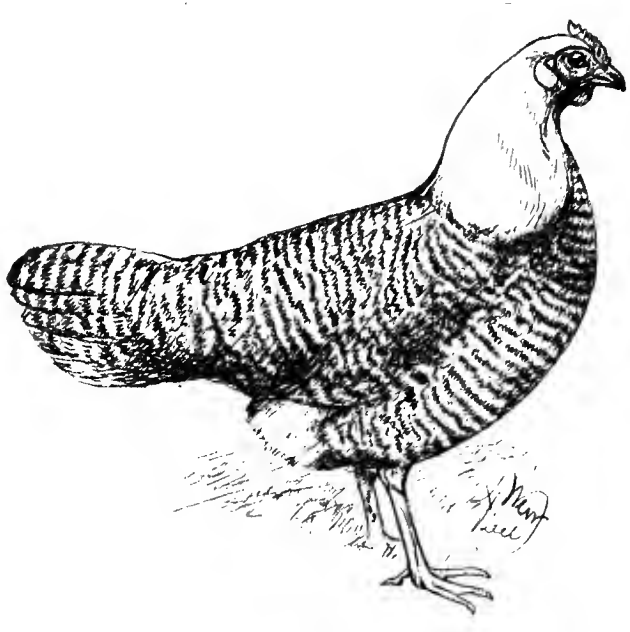
Eggs are sent from England to America, and from America to England, Germany and even to Australia and hatched, but the percentage of chicks hatched is variable. We have known twelve eggs sent from England to America to produce ten chicks, all of which lived, and we have known fifty eggs to produce but three chicks, two of which died in a few days after emerging from the shell.

Eggs are frequently shipped thousands of miles and a good hatch is had from them. When the eggs are strongly fertile it is not unusual to have every egg in a clutch hatch, even after they have been sent hundreds of miles. Once in a great while there is found a hen the natural temperature of which is not the proper hatching temperature, and in such cases the best eggs will not hatch.

There are several specially designed egg baskets and boxes on the market, made for sending eggs for hatching long distances. Where these can be procured it is best to use them, as they cost but a few cents each. Where it is impossible to get these, a light basket may be used. The writer always wraps each egg separately in paper and packs them closely in the basket or box, first placing a layer of excelsior or cut straw in the bottom. The same material is placed between the eggs and another layer on top of them. The top is then put on, leaving the eggs so closely packed that they cannot move from their position. The elastic material serves as a cushion to take up sudden jars and the jolting of railway trains. The small end is always placed lowest. Packed in this way we have shipped eggs that

went thousands of miles by rail and then were carried a long distance by stage and yet hatched well.

After eggs for hatching have been received from any considerable distance they should be allowed to stand for twenty-four hours before being put under a hen or into an incubator. The constant jarring received on a journey disorganizes them in a measure, and if they are allowed to stand quietly for a day they will return to the natural condition and the various elements resume their normal relations to each other, and a better hatch will be got from them.



OLD-STYLE DUTCH PENCILED HAMBURG

There is no known means of distinguishing what the sex of a chick hatched from any particular egg will be. This matter has been so thoroughly tested that there remains no room for doubt. Neither is there any method of mating fowls that will govern the sexes. It was at one time thought that mating a cockerel with old hens would produce a preponderance of pullets, but this has failed too many times for us to put any reliance in it.

A rather extended experience leads us to believe that males preponderate in hatching. Of course there are exceptions to this rule, but in the main we believe it will hold good. Double-yolked eggs quite frequently hatch, but they usually produce monstrosities. There are cases where two perfect chicks have been produced from one shell, but these are exceedingly rare. We have never heard of a case where one of these monstrosities has lived more than a few hours.

It is not a very rare thing for a chick to be hatched with some abnormal peculiarity, such as four legs or a double head. These probably are only freaks of nature such as are occasionally found in all animal life, being more frequently found in fowls on account of the large number kept.

OVARIUM, OR EGG-ORGAN

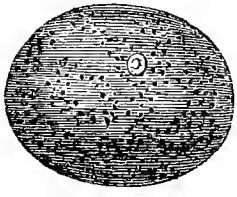
On three separate occasions we have known eggs laid by Guinea-hens which had mated with a common cock, to hatch, the cross-bred mongrel resembling both parents in some ways. The shape of the three we have seen was distinctly that of the Guinea, and the plumage had the distinctive spot of the plumage of the Guinea-fowl on many of the feathers, but the color was more that of the male parent.

Eggs from old hens produce more vigorous and stronger chicks than those from pullets. For this reason eggs for hatching should be taken from hens in their second year rather than from those in their first year. Old hens produce few eggs in winter and fewer at any time in the year. This no doubt accounts for the better quality of the chicks hatched from their eggs.

Development of the Egg

"Order is heaven's first law."—Pope's *Essay on Man.*

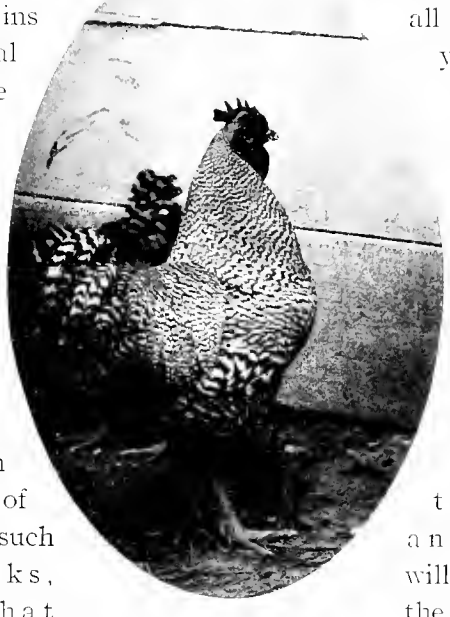
The following notes on this important subject are taken from Swainson's Work on "The Domestic Habits of Birds," London. To render this curious but difficult subject as plain as possible to those but little acquainted with physiology, we shall trace the egg from its appearance in the ovarium, or "egg-organ" (as we may call it), of the hen, till the final exclusion of the chick in the process of hatching. This subject has been investigated with much care and skill by some of the most distinguished observers and



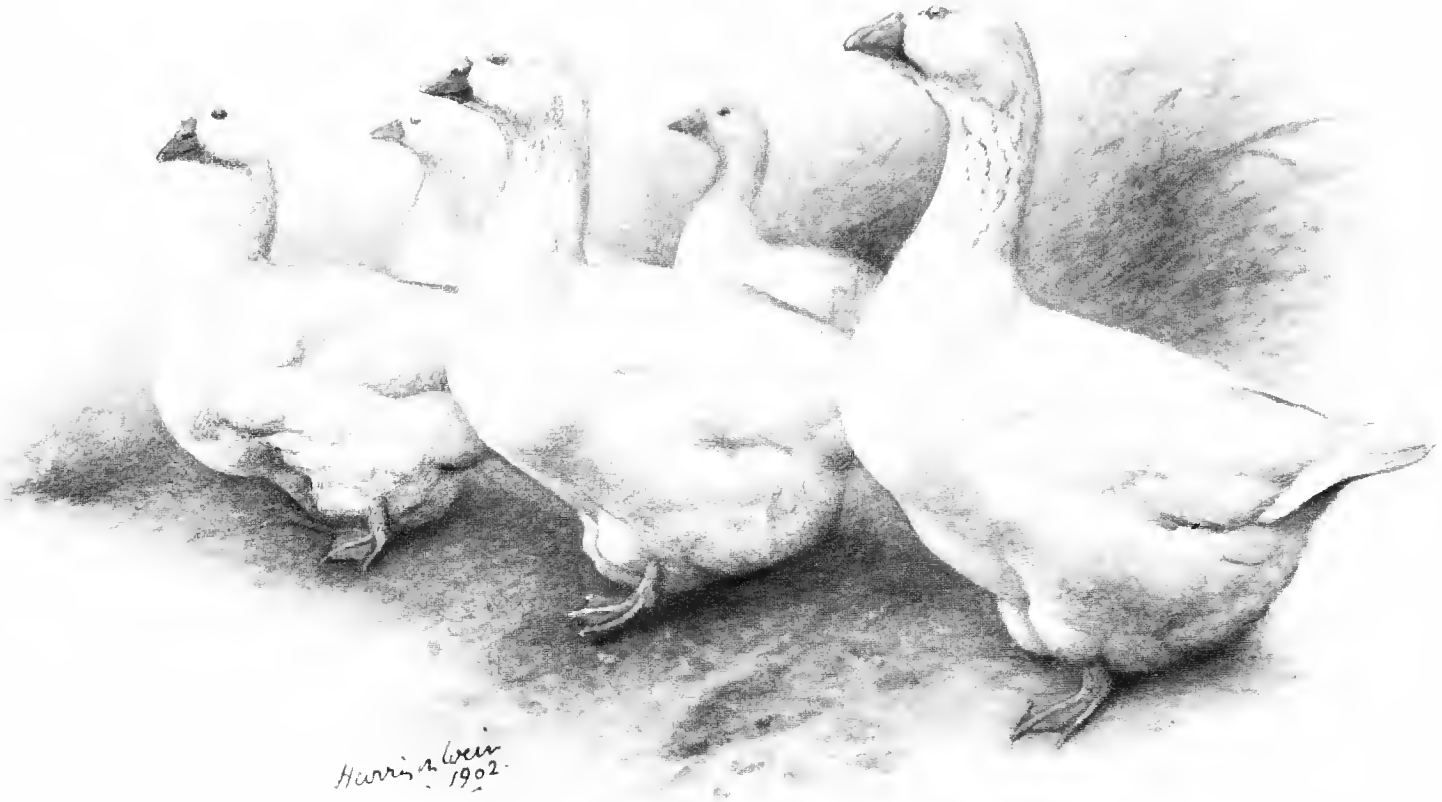
EMBRYO IMPREGNATED EGG

experimentalists in consequence of the light it was expected to throw upon obscure points in the early history of other animals whose development was of more difficult if not of impossible observation. We have endeavored to condense the chief facts ascertained into a brief but explicit sketch.

"The egg of a bird appears in the egg-organ (ovarium) under the form of a small yellow globe or sphere, frequently smaller than mustard seed, but gradually increasing in size till it drops from its slender fastening and falls into the egg-tube (oviductus). The egg-organ contains all the eggs which are to be laid for several years, each egg differing from the rest in size as well as in composition and color. The largest of them, which are destined to be first laid, are yellowish, while the rest gradually decrease in size and are less and less yellow. It has been attempted to establish an analogy between this detachment of the egg and the dropping of ripe fruit from a tree; but though we cannot deny the resemblance of the circumstances, we believe that such an analogy, as M. Dutrochet remarks, will not stand the test of observation. That the increasing weight of the egg, however, may, by stretching the slender attaching pedicle, so attenuate the blood-vessels that supply it with nourishment as to greatly weaken and ultimately to break it, we may with some probability suppose. Before dropping into the egg-tube there is no white nor shell, both of which are formed there by the addition of the glutinous substance called albumen and of the calcareous substance constituting the shell. From ill-health or accidents eggs are sometimes excluded from the egg-tube before the shell has begun to be formed, and in this state they are provincially termed 'oon' eggs."



BARRED PLYMOUTH ROCK
American bred



EMBDEN GEESE.

The property of Mr. F. G. Rawson

The Poultry Book

By
HARRISON WEIR, F.R.H.S.

American Edition Edited by
WILLIS GRANT JOHNSON
Assisted by
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as Associate Editor
and
Many American Experts

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CONTENTS OF PART III

"Incubators and Chicken Rearing"
THOMAS F. MCGREW, New York

* "The Feeding of Poultry"
JAMES E. RICE

From a drawing by Harrison Weir

A CAPON SITTING ON EGGS

INCUBATORS AND CHICKEN REARING

THOMAS F. MCGREW, NEW YORK

"The wise are always learning."—FITZHERBERT.

AS we have gained from experience a better understanding of the natural requirements for safe incubation of eggs, whether in the natural way under hens or within machines, we are more able to lend our aid in the better construction of both nests and incubators to be used for the purpose intended. It is quite usual for the hen that hides her nest to either select some secluded spot on the ground or to go into the haymow or strawstack. Seldom, if ever, will she select an unprotected spot that must be exposed to the changes of the weather. When preparing the nest for the broody hen, have it so constructed as to protect the eggs from the under side. Do not have it so shallow as to furnish no protection to the eggs from below, nor so narrow as to have it possible for a cold chill to cast its bad influence on the eggs from the side or end. Have the nest-box large enough to fully protect the eggs on all sides and below from sudden changes in temperature.

A good practice is to cut a piece of sod the size of the box and place it in the bottom of the nest-box as a protection. Some hold to the opinion that the presence of the sod lends aid in furnishing moisture to the eggs;

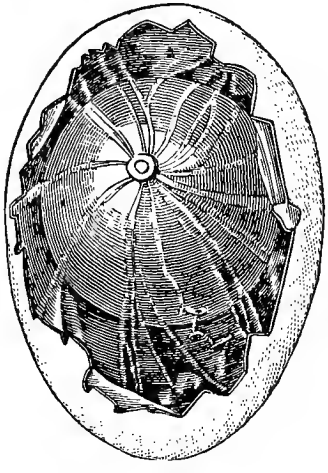
but whether this is true or not, it protects them from sudden changes. On top of the sod fill in with plenty of soft hay or straw below and on all sides of the eggs. A nest so constructed aids the hen in her continuous task of incubation by holding about the eggs the heat transmitted to them from her body. On the other hand, poorly constructed nests allow of possible injury to the eggs by permitting hurtful influences to gain ready access to the eggs and take from the accumulated heat.

Having prepared the nest-box, put the broody hen in it. Under her place a few eggs of no value, as dummies, to keep her quiet upon the nest. Some hens give trouble at first, and it is just as well to have them well settled prior to giving them a nest of eggs to incubate. At times it may be necessary to shut the hen on the nest for several days, allowing her to come off, and watching her return to prevent the possibility of her neglecting her duty. It is always best to have fresh-laid eggs for incubating, and a selection made so that all the eggs under each hen will be of the same size, or nearly so, and all of one breed, if possible. It is most satisfactory to set three or four hens the same day. When hatching-time comes, usually two hens can care for all the chicks that come from the four nests of eggs. The other two may be continued on their nests for another term of incubation or returned to the runs to recruit and prepare for laying.

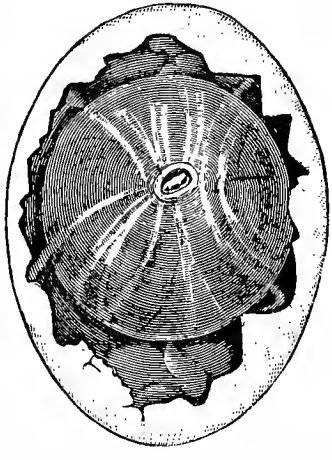
It is not unusual to see a room prepared for hatching eggs by having a double row of nests along the wall, with slat doors, in which broody hens are confined with eggs under them. The person in charge must see to it that each hen comes off every day and returns to her nest. As many as fifty hens are set in one room in this way. The floor should be covered deep with dry earth or fine sand to serve as a wallow. Another feature of vital importance is to rid the hens of all manner of pests, such as mites or lice, by the use of insect powder. Dalmatian or Persian insect powder is good. Rub plenty of it into the feathers of the hen when she goes to the nest and repeat the dusting after she has been on her eggs for two weeks. This, with her dust-bath during incubation, will almost insure against lice.

With so vast an expanse of country as we have in America, the time for hatching must be governed by climatic conditions. For exhibition fowls, the chicks should be hatched early enough to gain their full growth and plumage prior to the time they are to be shown. For winter-

laying pullets, April hatched chicks are the best. If hatched in March they do quite as well. In some parts of our country it is quite difficult to care for young chicks in March, the weather being so severe. Another fact worthy of consideration is that the chick grows best when the young grass begins to sprout and they can feed upon it. May-hatched chicks often do as well as those hatched earlier, especially if special care and feeding be given them. Chicks hatched later than May seldom make



New-laid egg with part of shell removed



An egg as it appears twelve hours after the beginning of incuba ion, with a magnified view of the embryo chick

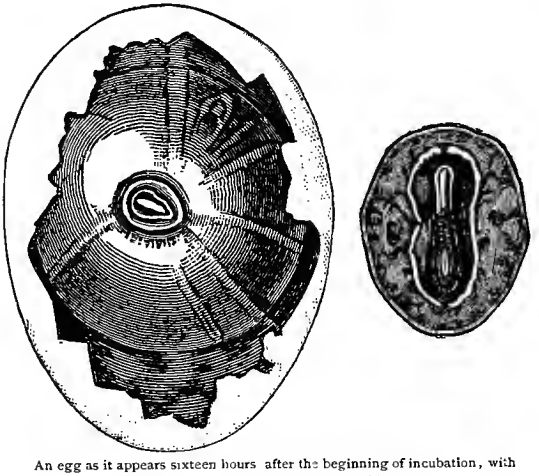
profitable winter-laying pullets. The late-hatched chicks make good market poultry. Market poultry, for broilers or small roasters, may be hatched at any time and marketed as soon as of suitable size.

An odd number of eggs is in favor when placed under a hen for incubation. Not, as some suppose, because there is "luck in odd numbers," but because nine, eleven or thirteen round up better in a nest than would an even number. The number of eggs "nested" for hatching should be regulated to accord to time, place, season and size of the eggs, or whether placed under hens or pullets. No hen should be given more eggs to nest than she can cover nicely. If she has too many she cannot properly cover them and poor results will follow.

Development of the Chick within the Egg

In the development of the chick we can do no better than give Mr. Weir's own words. He says that for many years the henwife has divided

eggs into three classes. If an egg is without a germ it is called "clear," for it does not cloud after incubation. When an egg begins to hatch and gets chilled, or its growth otherwise arrested before the chick is formed, then the egg is "addled," becoming rotten, and if broken it has a most offensive smell; this is the "addled" egg. Thirdly, when the chick is well formed in the egg it is called a "dead-chick" egg, and is never used in the *sportive* way that the "addled" one is. The knowledge of the progress of the development of the chick in the egg is of great use to the poultry trade, as, on examination of the eggs unhatched much is learned as to the cause and time of failure. I have therefore given the whole of Mr. Swainson's notes and diagrams from his "Habits of Birds," he in turn having borrowed them from Sir E. Homes's "Comparative Anatomy"; therefore they can certainly be relied on as being correct.

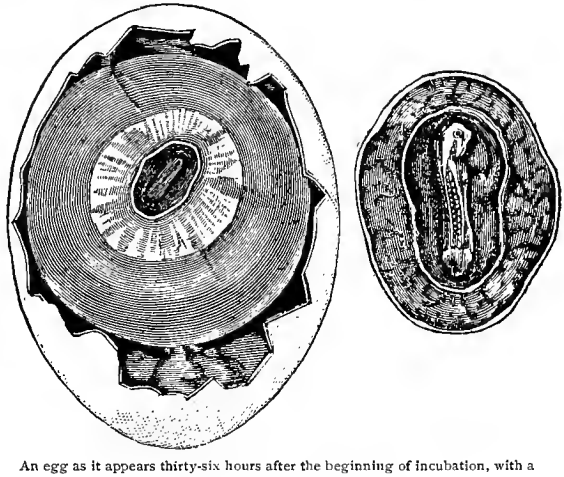


An egg as it appears sixteen hours after the beginning of incubation, with a magnified view of the embryo chick

"In about twelve hours from the time the mother begins to sit the commencement of life is perceptible in the germ (*cicatricula*). What seems to be the head of the chick appears joined to the body and swims in the surrounding fluid; and toward the close of the first day this apparent head is seen bent back by its enlargement. So says Haller; but Blumenbach thinks this a deceptive appearance, produced only by the destined abode of the future chick, no trace of which, he says, is perceptible before the second day, when it assumes an incurvated form resembling a thread of jelly enlarged at the extremities, very closely surrounded by fluid, from which it is scarcely distinguishable. The first appearance of red blood is perceptible on the yolk-bag toward the end of the second day, a series of points being observed which form the grooves; these closing constitute vessels, the trunks of which become attached to the chick. Haller says we can now perceive traces of the backbone (*vertrebra*), like small globules, disposed on two sides of the middle of the spine, the wings and the blood-vessels of the navel, distin-

guished by their dull color, also beginning to appear. The neck and breast are unfolded, the head is enlarged, the outlines of the eyes and their three surrounding coats now become perceptible, and the heart is seen pulsating and the blood circulating.

"Blumenbach does not mention his having seen the heart before the commencement of the third day, when it resembles a tortuous canal, and consists of three dilatations lying close together and arranged in a triangle, one part of which is properly the right auricle, forming at this period a common auricle, and another is the only ventricle, which afterward becomes the left ventricle; the third part (*bulbus aorta*) is considerably bulged out. It is remarkable that the heart at this period projects beyond the breast, and beats in triplets; first, on receiving into the auricle the blood from the veins; secondly, on discharging this blood into the arteries; and thirdly, on forcing it into the vessels of the navel—motions which will continue for twenty-four hours if the embryo be taken out of the egg. The veins and arteries may now also be seen branching over the surface of the brain, and the spinal marrow beginning to extend along the back; or rather, as has been beautifully shown by Marcel de Serres,* Tiedeman,† and Carus,‡ the spinal marrow itself, becoming enlarged, forms the brain. At this period the fluid surrounding the fetus becomes more consistent and less transparent. About the same time also the spine, which was at first extended in a straight line, becomes bent, and the joints of the bone (*vertebra*) become distinct. The eyes are distinguished by their black pigment and comparatively large size, as they afterward are in consequence of a peculiar slit in the lower part of the iris, a

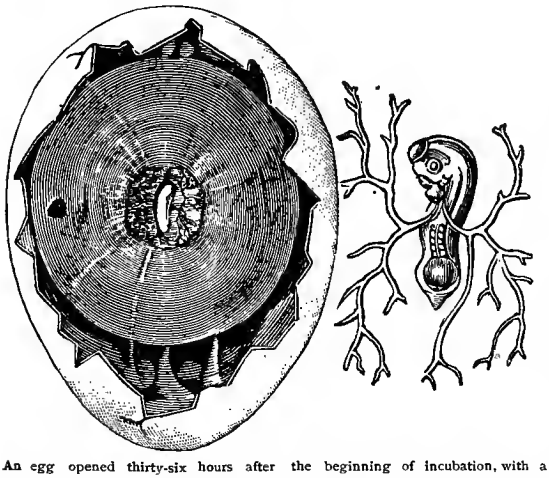


An egg as it appears thirty-six hours after the beginning of incubation, with a magnified view of the embryo chick

* "Du Cerveau," Paris, 1826; and "Sur le Cervelet," Paris, 1823.
† "Geschichte des Gehirns des Fetus." 4to. Leipzig.
‡ Gore's "Comparative Anatomy."

circumstance also observable in the nimble lizard (*Lacerta agilis*) and other animals which have no pupillary membrane.

"On the fourth day the pupil of the eye can be distinguished as well as the aqueous and vitreous humors. In the head are perceived five vesicles, filled with a fluid; and these as they enlarge approach each other, coalesce, and form the brain, invested with its membranes. The wings also grow, the thighs begin to appear, and the body extends to one-third of an inch in length. Several other important organs now become visible, as the stomach, the intestines and the liver. A vascular membrane begins to form about the navel, and grows during the succeeding days so rapidly that it covers almost the whole inner surface of the shell, apparently performing the office of lungs in carrying on the process of respiration.



An egg opened thirty-six hours after the beginning of incubation, with a magnified view of the embryo chick, in which is shown the first appearance of the principal blood-vessels

"On the fifth day the lungs begin to be formed, but cannot, of course, perform their functions, on account of the circumambient fluid. The vessels of the navel rise out of the abdomen; the heart is confined in a very thin membrane that covers the chest; and the muscles appear over the body in the form of an unctuous envelope.

"On the sixth day the gall-bladder is first perceptible, and the first indication of voluntary motion may be remarked. The spinal marrow, divided into two parts, is extended along the trunk; the liver, previously whitish, becomes of a darker, dusky color. It is now seven lines* in length.

"On the seventh day it is easy to distinguish the bill; and the skin, with the germs of the feathers, becomes obvious.

"On the eighth day the brain, the wings, thighs and legs have taken nearly their ultimate form; but, according to Scarpa, are still soft, flexible, and pellucid.† The two ventricles of the heart also appear like two bubbles,

* A line is the twelfth part of a French, or rather less than the eleventh of an English, inch.
† De Penit's "Ossium Structura Comment." 4to. Lips., 1799.

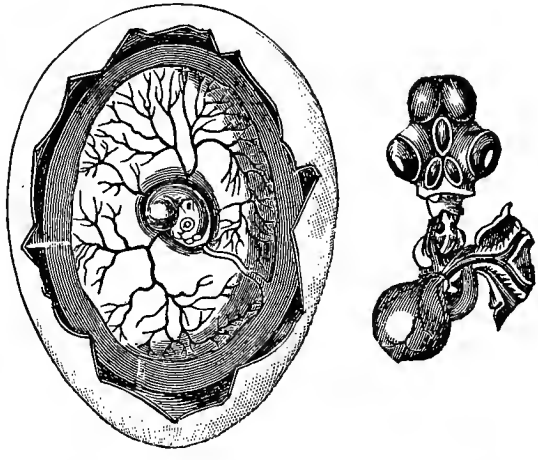
contiguous and joined above to the substance of the auricles; while two successive motions are observed now in them, as well as in the auricles, which resemble two separate hearts.

"On the ninth day the bones begin to be formed, appearing in the form of hard bony joints, the middle of the thigh- and leg-bones, according to Scarpa, becoming yellowish. These form the rudiments of the bony ring of the sclerotic, resembling a circular row of the most delicate pearls. At the same period the marks of the beautiful yellow vessels on the yolk-bag begin to be visible.

"On the tenth day the muscles of the wings are seen completely formed, and the germs of the feathers appear enlarging. Scarpa up to this period could observe nothing hard, but a yellow wrinkling of beautiful network.*

"On the eleventh day the arteries begin to be distinct, those which were previously at a distance from the heart now joining and cohering to it. It was now that Scarpa first observed the wrinkles in the leg- and thigh-bones to become rough and hard, and red spots to appear.

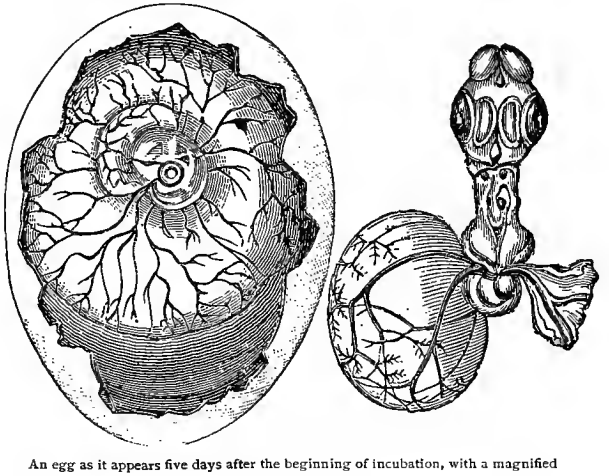
"On the twelfth or thirteenth day, if the membrane (*chorion*) enveloping the white of the egg be examined very cautiously by opening the shell, it will present, Blumenbach says, without any artificial injection, one of the most splendid spectacles that occurs in the whole organic creation—the most simple yet the most perfect substitute for the lungs. It exhibits a surface covered with countless blood vessels, venous and arterial, branching through its texture. The veins are of bright scarl color, carrying oxygenated blood to the chick; while the arteries, on the other hand, are of a deep crimson or livid red, bringing the carbonated blood from the body embryo. The functions of the two are thus the



An egg opened four days after the beginning of incubation, with a magnified view of the chick

* *Zoological Journal*, ii., 433.

reverse of those they perform after the chick respires. From the trunks of these arteries being connected with the iliac vessels, and on account of the thinness of their coats, they furnish the best objects for demonstrating the circulation of the blood in a warm-blooded animal. According to Scarpa, the thigh-bones, when dried, now preserve their shape.



An egg as it appears five days after the beginning of incubation, with a magnified view of the chick

"On the fourteenth day the feathers appear, well developed; and if the embryo be taken out of the egg it can open its beak for the purpose of breathing.

"During the remaining part of the process the yolk becomes gradually thinner and paler by the texture of the inner white; while an immense number of fringe-like vessels, with flaky terminations of a singularly peculiar structure, are formed on the inner surface of the yolk-bag, and hang into the yolk, evidently for the purpose of absorbing it and conveying it to the veins, where it is assimilated to the blood and applied to the nutrition of the chick. Blumenbach persuaded himself of the actual passage of the yolk from the floating vessel of the inner surface of the bag into the blood-vessels which go to the chicken; at least, he could distinguish yellow streaks in the red blood contained in the veins.*

"On the nineteenth day the embryo can utter sounds, and may be heard doing so through the shell. It breaks and escapes from the shell usually on the twenty-first day, but sometimes as early as the eighteenth and at other times not till the twenty-seventh.

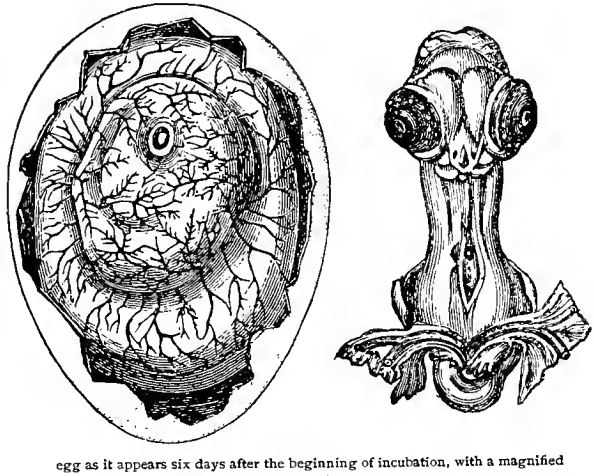
"The exit of the chick from the shell appears to us to be one of the most interesting processes of animated nature ever investigated by naturalists. We are indebted to Réaumur for a most minutely accurate account of this process†; and recently Mr. Yarrell has given a brief detail of his own

* *Zoological Journal*, ii., 433.

† "Oiseaux Domestiques," Mém. tom. vi.

observation upon several species of birds. It is the popular opinion that the mother-bird breaks the shell of the egg to free the chick from imprisonment —an opinion which must have originated from the circumstance that pieces of the shell are often broken and driven off to some distance while the membrane within remains unruptured, which it is supposed could not happen if the fracture were made on the inside by the chick. But it might, on the same principle, be argued that a wine-glass covered with parchment could not be broken by the stroke of a hammer without rupturing the parchment; for the membrane of the egg is elastic and yielding, while the shell is not. That the chicken, however, and not the mother, performs this office, has been proven by direct observations which may be readily verified. It is worthy of remark, that the fact was correctly stated so long ago as the thirteenth century, by Albertus Magnus, the great naturalist of the dark ages.*

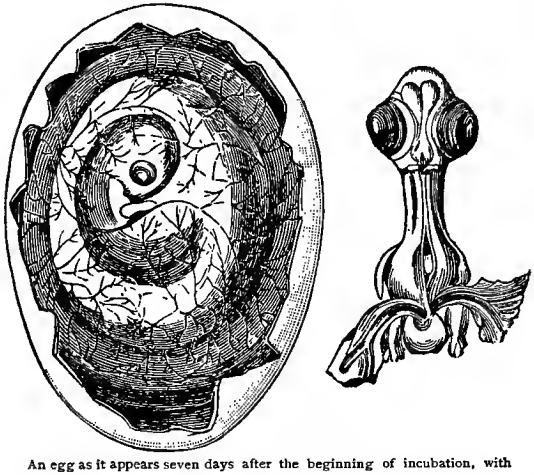
"It might be supposed that this task was much above the strength of the yet feeble chick, did we not reflect that the anxiety it must feel to escape must add greatly to its energy, which is further aided both by its peculiar structure and by the position it assumes. The bill is still soft, indeed, and to a careless observer would seem ill fitted for breaking the shell; but, superadded to the bill, 'upon the curved part of the upper mandible,' to use the words of Mr. Yarrell, 'just above the point there will be seen a small horny scale, nearly circular, having at its centre a hard and sharp projecting point, and by the particular position of the head this sharp point is brought into constant contact with the inner surface of the shell.' It is worthy of remark that the only use of this horny point seems to be to break through the shell, from which the chick escapes, and the



egg as it appears six days after the beginning of incubation, with a magnified view of the chick

* Apud Aldrovand's "Ornith," iii., 184, ed. Francofurti.

beak hardens by exposure to the air, it soon falls off, and on the second or third day only a light-colored mark is observable on the spot which it had occupied. It may, indeed, be easily separated by the thumb-nail when the chick comes forth. In pigeons, and probably in other birds which do not run about and feed the instant they are hatched, the bill-scale does not fall off for more than a week. Mr. Yarrell thinks the hardness of the bill-scale may be proportioned to the thickness of the shell, from its being very prominent, hard and sharp in a preserved chick of the Egyptian goose (*Anser gambensis*).



An egg as it appears seven days after the beginning of incubation, with a magnified view of the chick

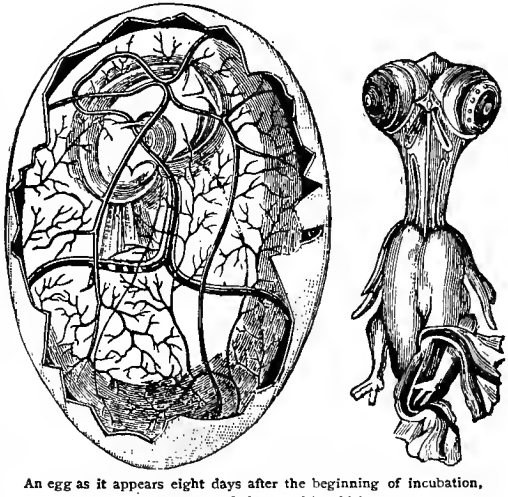
"The position of the chick in the egg appears no less unfavorable to its breaking through the shell than the softness of the bill; for it is rolled up almost like a ball, the neck sloping toward the belly, with the head in the middle, and the bill thrust under the right wing, as in birds when asleep. The feet also are bent up under the belly, as chickens and pigeons sometimes are when trussed for the spit, the claws being so bent back that their convex part almost touches the head. The forepart of the chick, as Réaumur observed, is toward the biggest end; and Doctor Prout adds that it "is so situated in the egg as, by its superior weight on one side, to assume such a position that the beak shall be uppermost."* It is surrounded by a thick, strong membrane, which retains it in the attitude just described, and is apparently unfavorable to its requisite movements. But closer inspection shows that all these circumstances tend to facilitate rather than retard its operations on the shell, which it must break before it can escape.

"The bill, indeed, though placed under the wing, as in the case of a sleeping bird, is thrust so far as to project beyond it toward the back, and the head, by moving backward and forward alternately, causes the bill to strike upon the shell, the action being partly guided by the wing and

* Phil. Trans. for 1822.

the body. It is to be remarked that the head, compared with the bulk of the body, is very heavy; and it makes, together with the neck, a load which the chick, even for several days after its exclusion, can with difficulty support. But in the egg, let the position be what it may, the head is supported either by the body or by the wing, or by both together; and the greater the size of the head the more efficient, of course, are the blows of the bill. The length of the neck causes it to be bent at this time, though after the first fourteen days it becomes nearly straight; but what seems to be done out of necessity to procure room, is here, as in many other operations of Nature, the best thing that could possibly have been done out of choice.

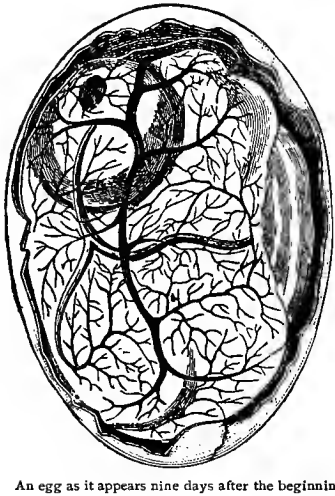
"By watching at the proper time, Réaumur frequently heard chicks hammering upon the shell with their beaks; and in the more advanced stages of the operation he could actually see them at work, through the translucent membrane. The result of the first strokes is a small crack, commonly situated nearer the larger than the smaller end of the egg. When this crack is perceptible the egg is said to be chipped. The membrane is seldom ruptured in the first instance, even when the hard part of the shell over it is detached; but in one instance, while Réaumur was observing the operations of a chick by candle-light, it was hard at work pecking at the membrane divested of the shell. It did not strike, however, but seemed as if endeavoring to wear it out, and make it thinner by continued friction.



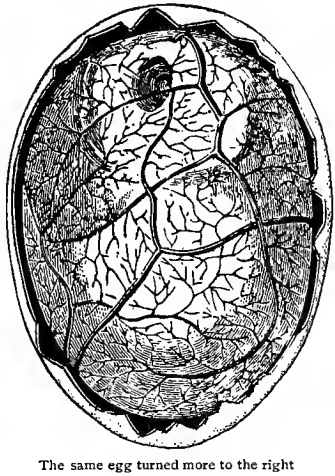
An egg as it appears eight days after the beginning of incubation, with a magnified view of the chick

"The continued blows extend the first cracks, and new pieces of shell are driven off almost in the same circle, the blows running round nearly the whole circumference of a circle which never cuts the egg obliquely, but always directly across; yet the bill all the while remains under the wing and always in the same position. In order to accomplish this, it is indispensable for the chick

to turn gradually round till it has completed an entire revolution; though this circumstance cannot, in consequence of the opacity of the shell, be actually observed. The demonstration of the inference, however, is completed by the several places at which the point of the bill appears, whilst the head is kept constantly under the same wing—a position so strictly preserved that it is persisted in even for some time after the separation of the shell into two portions leaves the chick a door almost as large as the dimensions of his prison. The revolution which the chick thus makes on its own body is invariably from left to right, and it is probably performed by means of the feet; for the claws, on pressing the shell through the membrane that separates them from it, must find in that shell the resistance necessary to effect the required circular motion. This notion is corroborated by the circumstance of the feet alone enabling the chick to effect its exit; for the wings and other members, with the exception of the neck and bill, are incapable of any action so long as the chick is in the shell.



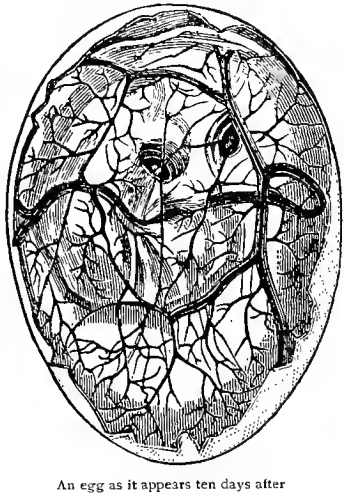
An egg as it appears nine days after the beginning of incubation



The same egg turned more to the right

"The fracture may be observed to be broader in some eggs and narrower in others, and even of different breadths in the same egg; while only a few pieces are broken off in some and a great number in others, the latter case exhibiting all the regularities of a glass bottle broken by the repeated gentle blows of a hammer. The effect required to be produced is the entire separation of the two portions, first of the hard shell, and then of the membrane, which is torn by repeatedly pecking it with the bill. All chicks do not succeed in producing this result in the same period of time, some being able to perform the task within an hour, others taking two or three hours,

while half a day is most usually employed, and some require twenty-four hours. 'I have seen chicks,' says Réaumur, 'continue at work for two days together. Some, again, work incessantly, others rest at intervals according to their physical strength. I have observed some, in consequence of their impatience to see the light, begin to break the shell a great deal too soon; for they ought, before they make their exit, to have within them provision enough to serve for twenty-four hours without taking food, and for this purpose the unconsumed portion of the yolk enters through the navel. The chick, indeed, which comes out of the shell before taking up all the yolk, is certain to droop and die a few days after it is hatched. The help which I have occasionally tried to give to several of them toward their deliverance has afforded me an opportunity of observing those which had begun to break their shells before this was accomplished; and I have opened many eggs much fractured, in each of which the chick had as yet much of the yolk not absorbed. Besides, some chicks have greater obstacles to overcome than others, since all shells are not of an equal thickness, nor of an equal consistence; and I think it probable that the same inequality takes place in the lining membrane.



An egg as it appears ten days after the beginning of incubation

The embryo chick taken from the preceding egg, with the amnion and vesicle removed

"'It is the practice in some countries to dip the eggs into warm water at the time they are expected to chip, on the supposition that the shell is thereby rendered more fragile and the labor of the chick lightened. But even boiling water does not render the shell more fragile; and though the water should soften it, upon drying in the air it would become as hard as at first.'* It is well remarked by Mr. Yarrell that the shell is rendered more brittle by

* Réaumur, *as before*.

the process of hatching, during which the egg of the common fowl loses on an average eight grains a day, the moisture being partly evaporated and partly absorbed, and the lining membrane at the same time becoming partially separated."*

First Food and Care of the Chick

There is considerable controversy at present as to the time that should intervene between the coming of the chick from the shell and its first supply of food. Some tell us that the chicks will do better if no food is given them until they are seventy-two hours old; while others say they should be offered food any time after twelve hours from the shell. The fact is, Nature provides the natural food for the young chick through the yolk of the egg when first it comes into life. This will provide their sustenance of life for at least twenty-four hours; during this period the chicks should be left to the hen or incubator to mother quietly. After twenty-four hours, the hen, with chicks, should be placed in a properly constructed coop that will furnish comfortable, warm quarters for them all.

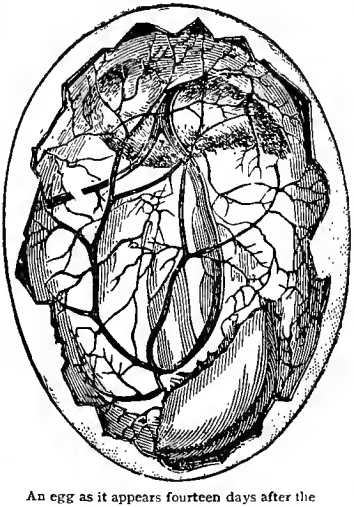
Clean, dry quarters and surroundings are absolutely necessary for the successful growing of chicks. To do well they must have a dry footing at all times. No matter how wet or damp it may be, if the chick has a sheltered, dry runway it will prosper. Filth and dampness are most destructive to young chicks—and too much coddling is not good for them. Good, reasonable care is all they need for best results where they are properly cooped and guarded from filth and the wet and chilly effects of damp, cold weather. Clear, cold weather is not so bad for them as the chilly wet or damp weather.

The proper method of feeding is to provide for the chick as soon as it comes from the nest or the machine; give them the opportunity to eat if they will, and trust to them to eat when food is needed. For the first meal bread-crumbs are good; hard-boiled eggs, shell and all, mashed fine and mixed with an equal amount of bread-crumbs, are much valued for the first day. Too much of the egg and bread is not good for them. After the first day, small oatmeal and bread-crumbs are good. Follow this with oatmeal or rolled oats; small broken wheat, and bits of broken corn no larger than the small oatmeal, and a little millet seed make a good mixture. Do not feed too much millet seed, as this is not good for them. There are a

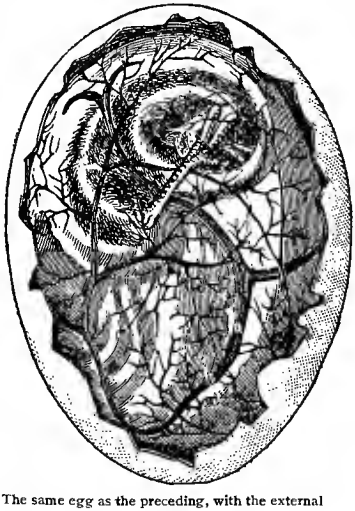
* *Zoological Journal*, ii., 436.

number of chick foods made of an assortment of small broken grains and seeds that are valuable because of the well-selected foods they contain.

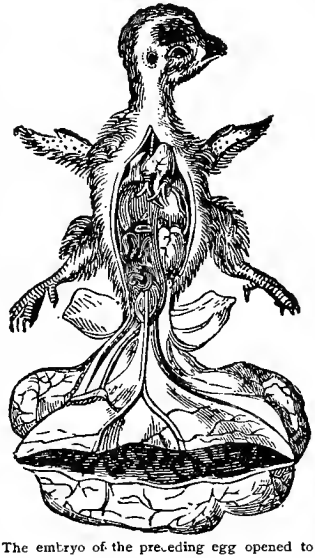
Grit is an absolute necessity. It is the digestive material for the chick. Small-broken egg-shell will do at first. Follow this with coarse sand or small chick-grit. If there is plenty of grass growing where the chicks can help themselves, this will furnish a full green-food supply; but when this must be furnished, grass, vegetable tops and lettuce cut into small bits will do. If the chicks can run about for bugs and worms, no animal food need be given them; but when they are not permitted to forage, cut green bone or meat meal should be supplied. Young chicks should be fed the first two weeks as often as every two hours from early dawn 'till dark. For the first day or two feed every hour is not too often. After two weeks old less often will do. Warm milk makes a good drink for them. If they can be kept from smearing the milk over their down or feathers it is well to use it in this way, but when they smear themselves with it they injure themselves more than they gain in its use. Fresh, pure, clean water should always be kept where they can help themselves.



An egg as it appears fourteen days after the beginning of incubation



The same egg as the preceding, with the external half of the vesicle removed



The embryo of the preceding egg opened to show the course of the principal blood-vessels which go to the vesicle and to the areolar membrane

The old English method, as given by Mr. Weir, was as follows:

"The first food generally given is stale bread-crumbs, cheese-curds, boiled ground rice, broken rice, oatmeal moistened with milk, some scalded rape seed, a little mustard seed, and, in two or three days, more ground oats and milk and some of the winnowings of wheat, oats or other farm seeds. The coops may be put into the kitchen gardens (but not for long) while the chickens are young, cauliflowers and cabbages being very favorite foods of poultry. If the chickens are of a small breed and of delicate habits, they may be fed on a kind of thick custard made of flour (two parts) and oatmeal (one part) mixed with two or three eggs and new milk, all stirred together in a dish or pan and put into a slack oven until it sets somewhat firmly; after cooling, it will crumble and prove excellent food for the first few days, if thought necessary; chopped boiled eggs were seldom or never given.

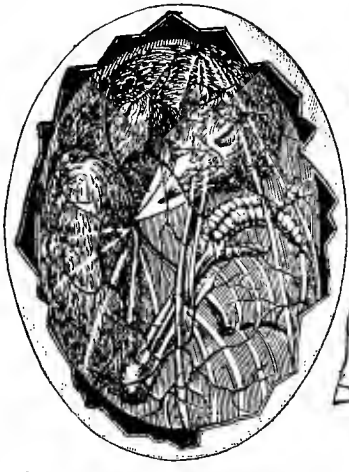
"The newly hatched chickens must be fed as early in the morning as possible, at first regularly every hour, and then two hours during the day, and a less number of times as they grow and feather. When taken from the hen they may be fed on one-third oatmeal or ground oats, with one-third boiled potatoes and one-third 'sharps,' all scalded and well mixed; at night, half-boiled wheat, barley or some other grain. If running with the adult fowls, a pan of food should be put under a wire or wooden cage with the bars placed sufficiently wide apart to allow the chicks to squeeze through and feed when so inclined, which they will do very frequently; this plan prevents the old birds getting the chickens' food. Clean water in clean pans should be given twice a day.

"If there is convenience for the purpose, the sexes should be divided as soon as they have feathered; and, if divided into flocks, they should be sized, and not numbered more than twenty in each, as otherwise the strong are very apt, in their endeavor to obtain warmth, to smother the weaker birds."

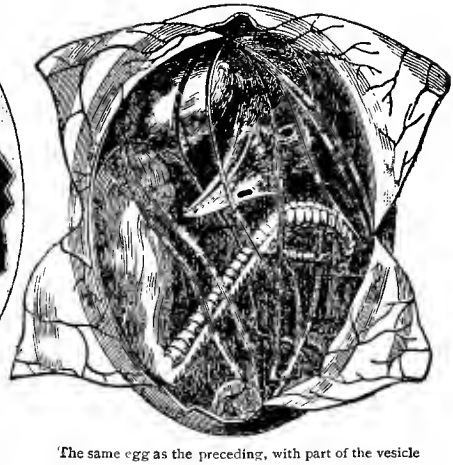
For many reasons, the early hatched chicks are the best. April- and May-hatched chicks make better winter-laying pullets than do those that come later. For exhibition, they may be hatched any time after the first of the year for the exhibitions of the following winter. The rearing of poultry for household purposes is a very old custom and has been a source of income and profit, more particularly from the sale of eggs and chickens to "higglers," for the purpose of fattening for market. The latter were raised under hens and turkeys, though in some instances artificial means were used for incubation.

The Incubator in England

The incubator is by no means a novelty in England. Mr. Weir says that in 1610 one Cornelous Drebel, then residing at Eltham, among descriptions of other wonderful inventions, declared that "By this peculiar ingenuity he could at all times of the year, even in the midst of winter, hatch chickens and ducklings without the aid of hens or ducks" ("Notes and Queries," 1st Series, ii., 7).

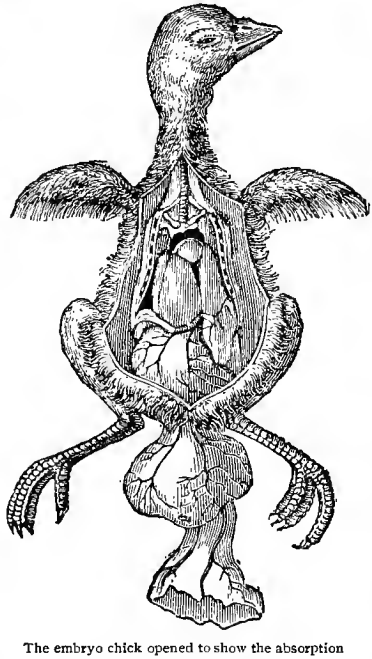


An egg as it appears eighteen days after the beginning of incubation



The same egg as the preceding, with part of the vesicle removed to show the embryo chick more clearly

While later, in his "System of Agriculture," J. W. (John Worlidge), 1681, and in the 4th Edition (1697), gives especial importance to the keeping of poultry, for he says that "they are kept to a very great advantage in the back sides and at the barn doors of great farms; and, as I have certainly been informed, a good farm hath been wholly stockt with poultry, spending the whole crop upon them, and keeping several to attend them; and that it hathredounded to a very considerable improvement." (Here is a poultry farm paying its way.)



The embryo chick opened to show the absorption of the yolk into the body

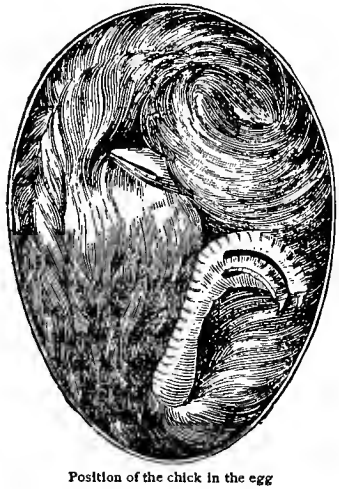
"In Egypt and China they yet hatch eggs in great quantities in open ovens made for that purpose. In several places in this country also one hen will lead the brood of two or three hens, so that

they be hatched near about the same time; therefore you may with much facility hatch three or four dozen of eggs in a lamp-furnace made of a few boards, only by the heat of a candle or a lamp, so that you order them that they may hatch about the same time as the hen hatches her eggs that you intend shall lead them; by which means one hen may in a warm room lead many chickens and raise them up with little charge and without the loss of time of other hens."

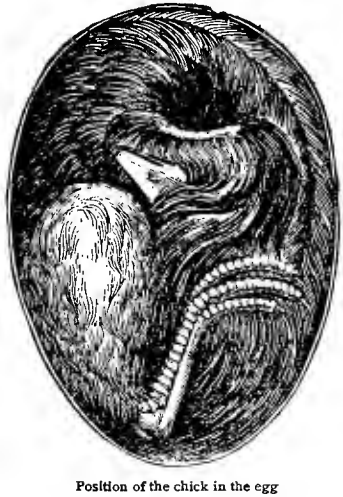
Thus it appears that artificial incubators were in ordinary use in England in 1681–97. No allusion is made to "rearers," though this method had not been neglected in France, and it is not until 1815 that I find the following mention of such appliances in the new "Family Receipt Book" of that date, under the heading of "A New Method of Rearing Poultry to Advantage; communicated by Mrs. D'Oyley to the Society of Arts, etc." "I keep a large stock of poultry, which are regularly fed in the morning upon steamed potatoes chopped small, and at noon they have barley; they are in high condition, tractable, and lay a very great quantity of eggs. In the poultry yard is a small building, similar to a pigeon cote, for the hens to lay in, with frames covered with net to slide before each nest; the house is dry (this is essential), light and well ventilated, kept free from dirt by having the nest places and walls whitewashed two or three times a year, and the floor covered once a week with fresh ashes. When I wish to procure chickens, I take the opportunity of setting many hens together, confining each to its respective nest; a boy attends morning and evening to let off any that appear restless and to see that they return to their proper places. When they hatch, the chickens are taken away and a second lot of eggs allowed them to sit again, by which means they produce as numerous a brood as before. I put the chickens into long wicker cages, placed against a hot wall at the back of the kitchen fire, and within an artificial mother for the chickens to run under; they are made of boards ten inches broad and fifteen inches long, supported by two feet in the front four inches in height, and by a board at the back two inches in height; the roof and back are lined with lambs' skins dressed with wool upon them; the roof is thickly perforated with holes for the heat to escape; they are formed without bottoms, and have a flannel curtain in front and at the ends for the chickens to run under, which they do apparently by instinct." (See also Réaumur's "The Art of Hatching and Bringing up Domestick Fowls of all Kinds," 1750, pages 249–304.) "The cages are kept perfectly dry and clean with

sand or moss. The above is the proper size for fifty or sixty new-hatched chickens, but as they increase in size they of course require a larger mother. When they are a week old the boy carries them and their artificial mother to the grass-plot, nourishes them, and keeps them warm by placing a long, narrow tin vessel filled with hot water at the back of the artificial mother, which will retain the heat for three hours and is then renewed from the steamer. In the evening they are driven into the cages, and resume their station at the hot walls, till they are nearly three weeks old, and able to go into a small room approriated for that purpose. The room is furnished with frames similar to the artificial mother, placed round the floor, and with perches conveniently arranged for them to roost upon." Mrs. D'Oyley lost large numbers of chickens from suffocation, the roofs of the artificial mothers not being sufficiently ventilated. This was remedied; then the food proved unsuitable. She found that coarse barley meal steamed until it was quite soft, mixed with minced boiled potatoes, better; with this they were fed alternately, and as a variant pellets of coarse wheat flour given occasionally.

An egg as it appears twenty days after the beginning of incubation, the vesicle and amnion removed to show the position of the perfect chick



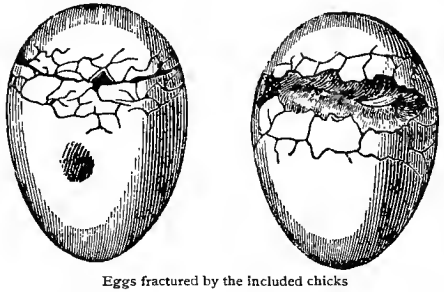
Position of the chick in the egg



Position of the chick in the egg

A few years ago Mr. Lawther, of Tonbridge Wells, a well-known fancier of Japanese frizzled Bantams, had his only hen of the breed die sud-

denly while sitting on fifteen of her own eggs. He could not get another broody hen, so improvised an incubator. He got a small frame—the lower part of a chair—putting a somewhat small iron tea-board on the top, and on this a wicker basket nearly filled with cotton wool, which was hollowed for the reception of the eggs, which were then covered over with more cotton wool. Under the tea-board was placed a small oil or paraffin lamp—the eggs were turned and aired twice a day — and with this contrivance Mr. Lawther managed to hatch and afterward to rear thirteen out of the fifteen eggs, and thus renewed his strain of bantams which would have been otherwise lost.

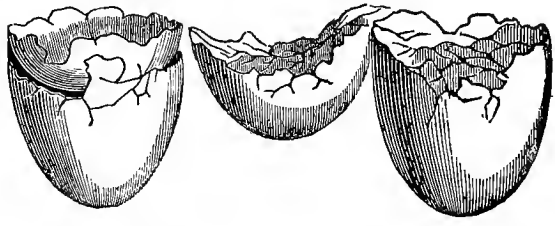


Eggs fractured by the included chicks

Of late years many kinds of incubators have been invented and offered for sale, all more or less useful, and varying in price, and the number of eggs that can be placed in each machine varying from 50 to 200. Of these I have found "Hearsons" very successful. On one occasion from 100 hens' eggs 92 chickens were hatched, and from 80 to 85–7 was not uncommon. Of course almost everything depended on the vitality of the eggs inserted. The temperature used was 102–3° Fahr., but I am inclined to think that a degree or two more would have been as well if not better. If an incubator is found to be a "necessary" adjunct to the poultry yard, it is best to place it in a ventilated room without draught, and entirely under the management of one person, and to have it attended to at certain times with the utmost punctuality. In mine the eggs were turned and aired for fifteen minutes every morning at 9 A.M., and again for ten minutes at 6 P.M., and the lamp "seen to." The eggs should be dated on one side with black, and on the other with red; thus during the day the red will be uppermost, and at night the black, by which means, by a single glance, the poultryman can tell whether all the eggs have been properly turned; and also by always having the date uppermost the time for hatching may be watched to some advantage. It might be an improvement to put on the egg, besides the date of insertion, that of the expected exclusion. As to the other rules, etc., it is best to follow exclusively those given by the makers at the time of the purchase of the incubators and artificial mothers.

As regards my own experience, I have never used the ordinary artificial

mothers until lately. Previously, on the chicks being hatched and "dried off," they were taken to one of my vineries, where grapes were being "forced" by a boiler and heated pipes. Boxes, with two holes for ventilation, lined and padded with flannel, and having portions cut out at the ends to allow the pipes to pass through, were placed over the lower hot-water pipe. Over the pipe was hung flannel with cuts or slips, which nearly touched the ground—so, whether under, about or clustered within, the chicks were warm and the temperature even. In front of the boxes were two holes for ingress and egress from the floor of the vinery, which being a low one, they ran about at considerable liberty. A hole in the wall of the vinery could be opened when thought necessary, and the weather fine and dry, so as to allow of exercise in the outside air. With regard to food, the chicks were fed in the usual way, with the addition of chopped lettuce, cabbage, watercress, onions or chickweed, but of all green food they mostly preferred the tender spring cabbage. After a fortnight, or rather more, according to breed and growth, the chicks (flocks of fifteen to twenty) were put into cucumber frames with perches about four or six inches high put across the deepest part. This plan kept them off the damp ground and also prevented suffocation from crowding. The upper part of the glass of the frame was covered either with a Russia mat or boards, which was a shade by day and warmth at night. A hole was cut in the front part of the frame and a tin slide made to fit, so that the chicks could be shut in when needful. These frames were set out on the grass, and moved every two or three days at the least. With this method I had two advantages—that of early grape-growing, which proved profitable, and the easy and healthy rearing of my chickens. The sexes were divided, and as a consequence there was less fighting among the old English game chicks. They were kept under the frames at night, and in wet weather by day, until six to eight weeks old; after that they were, if the nights were sufficiently warm, allowed to roost out in the hedges or apple trees, if they were so inclined, and which they generally preferred doing; with this treatment the birds were most healthy and strong, and there were very few deaths, and more seldom any disease. If there was



Positions of the shell after the escape of the chick

not room for all the chicks incubated hens were used, and they were cooped out in the ordinary way.

The rearing of chickens is still largely practised in Kent, Sussex and Surrey, and by some more profitably than others, for the reason that the latter rear too long, continuing far into the time when they are almost a drug in the market,* instead of only "working" at and for the scarce and high-priced time—that being the end of winter and early spring.

Here is an instance of the latter: A young farmer, having much grass land about his house, with also a barn, oast-house, sheds, etc., asked me if it would pay to rear chickens for the market, he having such good shelter and runs. My advice was this: "Get three or four incubators holding from 150 to 200 eggs. Have a couple of hundred hens of the best kind, such as the white-shanked Kent, Sussex and Dorkings and some of the properly proportioned Langshans, of these last at least half. In addition, buy up all the eggs in the neighborhood from those cottagers and others who keep good table-fowls, thus saving the expense of keeping the hens when you do not want the eggs—*i. e.*, the cheap time, etc. Raise some thousands of early chickens by hatching the bought eggs and those from your own hens, either by incubators or by sitting hens. Leave the eggs laid in the nests to get the hens to sit early. Have artificial mothers placed in your meadows and let the chicks run about them; this will help your grass and manure it for the haytime. Rear all your chicks so as to have them all sold to the higglers by at least the first week in May, so that your grass will be then not only well manured, but left clear to grow into a fitness for cutting and making hay. After the chickens are all sold cull off the worst layers of the hens, which will be about half, and sell your incubator if you can get a good price, and buy fresh for another year," etc., etc.

Mr. Guest followed my advice and reared more than 3,000 chickens, all of which were off the land before the second week in May, after which the grass grew strongly, and his hay crop and feeding good; and he told me that, raising and selling at the dearest time, the early spring only, he had realized fifty pounds a thousand, which about paid his rent. Had he gone on hatching and rearing he would have got into the low-priced time, lost his grass, feed and hay, and not gained on the latter produce.

When good-bodied, well-bred early chicks are bred in any quantity, there has never been, nor is now, any difficulty of selling, the higglers being

* This could be obviated by cold storage.

only too glad to buy at fair and generally very remunerative prices; but it is useless to try to "market" ill-bred, ill-shaped, neglected and badly reared and fed chickens; for the best of almost everything there is mostly the "ready sale." For my own old five-toed white-shanked old Kent chicks the higglers would give me a shilling each more than for nearly all those of other breeders, excepting Mr. Guest (before mentioned).

I do not believe that it pays to rear middle-season chickens, nor to keep hens to lay "summer eggs"*—the time when they are so abundant that the market is glutted and the prices accordingly low. It is only winter eggs and the very late and very early birds that are really profitable. Others may be raised for the household, and for such purpose summer layers kept, but for commerce I do not think it is desirable, unless cold storage can be utilized, when, if so, the summer eggs will prove almost as advantageous and lucrative as those of the winter.

Now that incubators are found reliable, both in England and America, poultry farms are established, where the hatching and rearing, fattening and marketing, of both ducklings and chickens has become a business of very considerable importance. Of course this can only be done by good management, fertile stock, the requisite capital and perfect organization; and such can only be arrived at with any degree of certainty by small beginnings, keen observation, and careful attention to every detail, however apparently small or insignificant. Evidently it is a growing industry, and will presently become a highly successful one.

There is another phase of chicken rearing, and I think a useful one, but as yet untried and neglected. It is this: there are a number of fanciers of high-class poultry that have no room or convenience for hatching the eggs of their stock. What is wanted, then, is a reliable person to whom the eggs may be sent, hatched, the chicks fed and tended until they are two or three weeks or even a month old, as required, at a fixed payment of so much per dozen. This would be a boon to the fancier class of the community, and a helpful source of income, perhaps, to ladies living in a suitable country. In Egypt and America incubation of this kind is carried on to a wonderful extent. Here is an excerpt from *The Times*, November 22, 1890: it conveys my meaning, and is worthy of consideration:

* Though this might prove lucrative if district cold-storage depots were provided either by County Councils or private enterprise.

"*Artificial Hatching in Egypt.*—The United States Consul-General in Egypt, in a report recently published, describes the system of hatching eggs by artificial heat pursued in that country from time immemorial, and still in active operation. One establishment visited by the Consul-General was wholly constructed of sun-dried bricks, mortar and earth. It was 70 feet long, 60 feet wide and 16 feet high, and was provided with twelve compartments or incubators, each capable of hatching 7,500 eggs, or altogether 90,000 at one time. The season begins in March and lasts until May, and three batches of eggs are hatched in this time, each taking an average of three weeks. The fourth week is given to removing the chickens and preparing the incubators for a new batch of eggs. The number of eggs treated at this establishment in a single season was therefore 270,000, from which 234,000 chickens are usually obtained. The percentage of chickens would be greater, but the eggs are in some instances procured from long distances and in large quantities, and are therefore liable to damage. The price of eggs is 2½d. per dozen, and chickens just issued from the shell are sold at 7½d. per dozen. The loss of chickens after incubation is comparatively small. The whole staff of the place is a man and a boy, who keep up the temperature to a level of not less than 98° Fahr., arrange the eggs, move them four or five times in the twenty-four hours, look after the chickens, and hand them over to the buyers. The number of chickens hatched in this manner throughout Egypt is estimated at 75,000,000, and would, under ordinary circumstances, require 1,500,000 mothers."

General Use of Incubator in America

Artificial incubating and brooding has come into general use in America. It is quite usual to see the small grower make use of both incubators and brooders for all their hatching and brooding. The fact that the chicks can be grown without any danger from the insect pests by the use of the artificial methods has had an influence in its favor. Then, again, with incubators and brooders one may hatch and grow as many fowls as they wish of the non-sitting varieties without having other fowls to brood their chicks; and one need not delay the hatching season for the lack of broody hens so long as they can have ready at hand an incubator of modern make and a well-constructed brooder, in which to grow chicks.

Thousands of chicks and ducklings are hatched each year for broilers. At Allentown, Oxford and Harrisburg, Pa., there are

PRIZE-WINNING WHITE DORKING COCKEREL

located three very large farms that grow fully 100,000 ducklings during the year. At Sidney, Ohio, is a plant that turns out many thousand broilers per year. These are only samples of the many plants of this kind throughout the country. All such plants hatch their chicks and ducklings with incubators and grow them in brooder-houses built for the purpose. These houses are heated with hot-water pipes that go from a water-heating stove located in a cellar or pit in the centre of the house. From this the pipes run to the right and left to heat the hovers of the brooder-house. These houses are warmed, without the hovers, in the same way in cold weather, so that the temperature may not be chilling for the small chick.

There are two systems for heating incubators—one the hot-air system, in which the air is heated and carried into the machine over the eggs and distributed through the egg-chamber and carried out through ventilators; the other is known as the hot-water system. In this the water-tank is placed above the egg-chamber and the water heated from a lamp, the same as the air is heated for the hot-air system. The hot-air machine responds more quickly to the effects of both heat and cold, and is more generally used than is the hot-water system; at the same time, the hot-water system has its enthusiastic followers who will not listen to any other method of heating. When properly constructed, both will do good and satisfactory work; but, to be successful, the machine must be of correct construction, properly and well built, and properly cared for.

The incubator, when in operation, should be placed where there will be a regular and even temperature not lower than 50° nor above 70° Fahr. For this reason incubator cellars properly constructed are best, or the incubators may be placed in the cellar of the house if the cellar maintains these degrees of heat. When placed either in the house, cellar, barn or buildings it is best to have a permit from the insurance agent to run it therein. A damp atmosphere without is by far better than a dry heated air. When the air without is too dry, the floor about the incubator may be moistened to advantage. An even temperature both within and without the machine is conducive to best results. The most desirable temperature within the machine ranges between 102° and 104°, according to the location of the thermometer, which should be placed in each machine as directed by the makers.

The turning and airing of the eggs during the three weeks of incubation is of vital importance. The turning or moving of the eggs during incuba-

tion is to prevent the "blastoderm," or germ skin, from coming in contact with the inner membrane of the shell. If all the eggs are moved once or twice a day with the hands, this will suffice. They are usually turned completely over from one tray to another. They must be so moved each day as to completely change their position, and should be left out of the machine to air from twenty to thirty minutes, providing the temperature of the room is not below 65° When lower than this, ten or fifteen minutes will do. The inclination is not to air the eggs as much as the hen will during her time of incubation. When it is cold she will stay away a short time only, but when warmer the time is prolonged. The desideratum is to turn and air the eggs and not to chill them.

The eggs may be tested for fertility from the fifth to the seventh day, according to the ability of the one in charge to select the clear from the fertile eggs. The clear or non-fertile eggs may be removed. They are just as good for cooking as eggs that have been kept for a week during warm weather either in the house or in the store. Being in an incubator for a week will not injure a clear egg as much as will the keeping of it in the house a week in summer. These clear eggs from the incubator are usually cooked and fed to the young chicks, or sold as incubator eggs to the manufacturing trade. Proper ventilation and moisture is of vital importance. This is, or should be, fully provided in all machines.

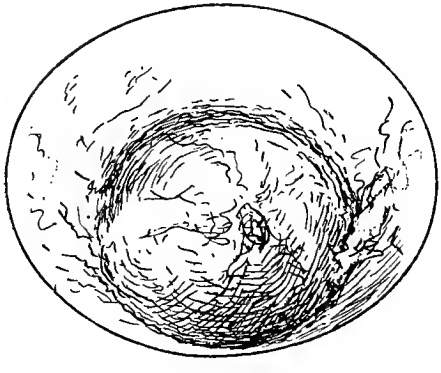
The system of artificial brooding covers the ground from the small individual indoor or outdoor brooder for forty chicks to the brooder-house for thousands. The principle is the same. When the chicks go from the nursery of the incubator to the hover of the brooder the temperature within or under it should be 90°. The outer room of the brooder, where the chick goes to eat and run about, should be 70° at the start. As the heat under the hover is lowered, as it should be from week to week, the temperature of the outer runway should be lowered to correspond. All brooders, whether of the indoor or outdoor pattern, will do best when placed under shelter during early spring while the weather is cool. Too much heat or dampness is most destructive to the young chicks.

The brooding of chicks in coops with hens may be governed or successfully accomplished through following the simple rule of cleanliness, proper feeding and protection from dampness. Cleanliness includes clean, warm coops or boxes for the hens and chicks. These coops must be so

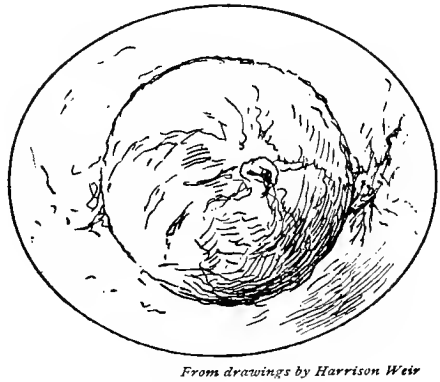
PRIZE BLACK-BREASTED DERBY RED OLD ENGLISH GAME.

The property of Mr. Harrison Weir.

constructed as to protect the hen and chicks from wet, damp and cold, as these are the worst enemies of the chick. More losses come from the result of exposure to dampness and filth than from all other causes. If thorough sanitary methods are observed there will be little chance for the vermin which at times work such awful destruction. When properly protected there should be little or no trouble in the growing of the brood, if they are carefully fed and watered.



Egg left unturned for two months



From drawings by Harrison Weir

Egg turned twice daily

THE FEEDING OF POULTRY

JAMES E. RICE, NEW YORK

SUCCESSFUL feeding of poultry is both a science and an art. The science is knowing the reason why. The art is having the skill to do. The former must be learned by careful study and observation. The latter can only be acquired by actual experience—handling fowls.

Poultry feeding is not an exact science. There is much that we do not know; and much that we think we know—sometimes, unfortunately—is not so. But each year adds more to our store of knowledge; each year by comparing experiences we are coming to agree upon certain methods and practices, and from facts thus obtained we can lay down rules. But rules are not always safe—conditions so often vary. It is to discuss these rules and facts that this series of articles is written, with the hope that from them some principles of feeding poultry may be sifted which any one can apply to varying conditions. It is prepared after a good many years of study and experience in the rearing and handling of fowls on the part of those who contribute. What is here said, however, is not given as infallible, nor is it intended to lay down fixed methods of procedure. But it is desired to stimulate those who read it to think for themselves—to compare it with their own experience and observation and to thereby arrive at safer conclusions and firmer convictions.

FOOD AND ITS RELATIONSHIP TO PRODUCTION

The relationship between food and animal nutrition is largely a question of cause and effect. The food is the cause, and the growth or the production is the effect. And there is a beautiful harmony between them, which is, that the character of the food determines the kind of growth. If the food is deficient in any nutrient, the growth also will be deficient in the same respect.

In order to make this relationship clear, let us examine the finished

product—*i. e.*, the fully developed fowl or egg. The following analyses* of the hen, pullet and capon include the entire fowl—bones, feathers, blood, viscera, etc. The analysis of the egg is that of a fresh egg, including the shell.

	Water	Ash	Protein	Fat
Hen	55.8	3.8	21.6	17
Pullet	55.4	3.4	21.2	18
Capon	41.6	3.7	19.4	33.9
Fresh Egg	65.7	12.2	11.4	8.9

The ash, or mineral matter, as it is sometimes called, was found most largely in the bones and the shell of the egg. The protein is a general term for substances containing nitrogen in the form of albumin—casein, etc., and is represented by the lean meat and the white of the egg and a portion of the yolk. The fat and water we all recognize by name and by sight.

It will be interesting now to compare the analysis of some of our common poultry foods and note their close relationship to the substances found in the bodies of the fowls and in the egg—which is simply an unorganized chicken.

	Water	Ash	Protein	Carbohydrates	Fat
Corn	11	1.5	7.9	66.7	4.3
Peas	10	2.6	16.8	51.8	.7
Mangels	89	1.1	1.1	5.4	.1
Clover Hay	15	6.2	6.8	35.8	1.7
Sunflower Seed	8.6	2.6	12.1	20.8	29
Meat Scraps	10.7	4.1	66.2	.3	13.7

It will be seen that we find all four compounds represented in the raw materials—the foods—that we found in the finished product—the meat and egg—and also one in addition, which is called carbohydrate—a term used to represent a class of food nutrients some of which are starch, sugar and gums. They have the same functions in the body as fat or oil—*i. e.*, to make heat and form energy and also to make fat, but not being as valuable as fat for these purposes they are given separately. However, they can be grouped together by first multiplying the fat by two and one-quarter and adding it to the carbohydrates. The reason for multiplying by two and one-quarter is that the fat is considered to be two and one-quarter times as valuable for fuel as the carbohydrates. By this multiplying and adding they are united on equal terms, and when so grouped a clearer comparison can be made between the protein (the muscle-maker) on the one hand and the carbohydrate (or heat, energy, fat-formers) on the

* Professor Wheeler, Geneva, N. Y., Experiment Station.

other hand. A still clearer idea of the proportional relationship between these two great classes of food nutrients is obtained by reducing them to lower terms—expressed by the number of pounds of carbohydrates in a food for each one pound of protein that it contains. This relationship is found by simply dividing the total carbohydrates by the protein, and is expressed as one pound of protein to whatever number of pounds of carbohydrates are shown in the dividend. This is called the nutritive ratio, or,

HEN AND CHICKS

From a sketch by Harrison Weir

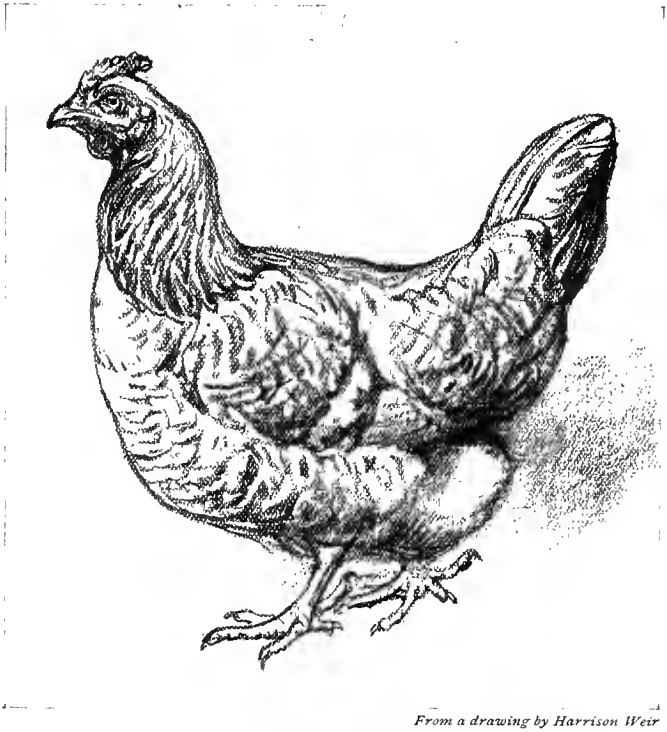
to express it in another way, the nutritive relationship of the protein (the muscle-makers) to the carbohydrates (the fat, heat, energy-formers); or, for example, one pound protein to 9.7 pounds of carbohydrates, which is the nutritive ratio of corn. To save time, part of the formula is left off, because it is generally understood, and the nutritive ratio is then expressed, for corn: 1 : 7.9. In a food or a ration where the relative amount of carbohydrates to protein is *small* it is said to have a *narrow nutritive ratio;* where the relative amount of carbohydrates to protein is *large* it is said to have a *wide nutritive ratio.*

From what has been said it must be clear that there is a close relationship between the food an animal eats and the growth the animal can make or the product it can produce. That such is the case not only has been proven by careful experimentation, but it is recognized by common observation.

By noting the wide variation in the foods given in the tables it will be seen that in corn there is only 7.9 pounds protein, while in meat scraps there is 66 per cent.; that in sunflower seed there is 20.8 per cent. carbohydrates and 29 per cent. fat, while in corn there is 66.7 per cent. carbohydrates and only 4.3 per cent. fat. In the matter of ash there is also wide difference, as, for example, 6.2 per cent. ash in clover hay, 19.5 per cent. in meat meal, and only 1.5 per cent. in corn. Is it not apparent, then, that a laying hen requiring 12.2 per cent. of mineral matter to make an egg, and having 3.8 per cent. in her body, which must be maintained, if fed upon corn alone must eventually have weak bones and soft-shelled eggs? Would it not be reasonable to expect a pullet, whose body contains 21.2 per cent. protein and whose egg contains 11.4 per cent. protein, to make slow growth and lay few eggs—or no eggs at all—when fed upon corn, which contains only 7.9 per cent. protein. To be sure, she might eat enough food low in protein to get sufficient nutrient to supply her daily needs. But the nutritive ratio of corn is one pound protein to 7.9 pounds carbohydrates. What will the pullet do with the excessive amount of carbohydrates? There are but two things she can do. She will use what she needs for heat and energy, the rest will either be stored up as fat or pass undigested. If this exclusive corn-feeding should continue, she would get exceedingly fat, the supply of blood would become deficient, and if this feeding should still continue, the inability of the fowl to renew broken-down muscular tissue because of lack of protein would weaken the body, growth would cease, and loss in weight would soon follow, which most likely would result in death.

It may seem almost impossible to believe that such results could follow from exclusive feeding of a food so good and so universally used as corn. This statement, however, is not guesswork, but is based not only upon personal observation and experience, but also upon careful experiment. The same result can be, and frequently is, brought about by feeding several kinds of food all of which, like corn, are too fattening. Did you ever find a condition where many hens in a flock would be found dead without any apparent cause except that the body would be filled almost solid with fat? That is one evidence of feeding too-fattening foods.

With chickens the result is not surplus fat, except for a very short time, because they are active and have not yet built their framework. But eventually it results in dwarfed, pinched-up growth. What is here said is not intended to be an argument against corn, or potatoes, or sunflower seed, or any other fattening food, but it is a plea for a ration that not only contains these foods, but also protein foods like peas, oats, wheat, bran, middlings, clover, meat, milk, and the like.



From a drawing by Harrison Weir

OLD KENT SPECKLED HEN

How to put these foods together so as to supply the protein and carbohydrates in the proper proportion for the purpose intended is called ballancing the ration. As near as we know now, the best general results with laying hens should be had by feeding a balanced ration containing one pound protein to five or six pounds carbohydrates. This will differ somewhat with conditions—such as breed, age, temperature, exercise, etc.

It may be well to note right here that while evil results will surely follow any radically wrong feeding if long continued, nevertheless the hen, like all other animals, has a wonderful power of adaptability. If the food should be deficient in carbohydrates, which often occurs where much peas, meat, oil meal, etc., are fed, she apparently has the power of using the protein for fuel, or possibly even to make fat. We find hens getting too fat when fed on a very narrow ration if it happens to be rich, easy of digestion and

abundantly fed. The hen's power of substitution—*i. e.*, of using protein to take the place of carbohydrates—does not work both ways. She does not have the power of using carbohydrates to take the place of protein. That is why hens usually suffer less when fed a too *narrow* ration than they do when fed a too *wide* ration. That is why an animal will starve to death when fed abundantly and exclusively on sugar, starch and fat. But evil results will follow both extremes. If too much protein is consumed, the blood will become overcharged, resulting in a plethoric condition which, if persisted in, would overtax the kidney to throw off the surplus materials, and would result in debility.

In order to illustrate the difference between properly balanced and improperly balanced rations, several combinations are here given. The reader can easily make up others, according to the foods he may have or can purchase, by consulting the feeding tables.

It has been found by Professor Wheeler, of the Geneva, N. Y., Experiment Station, that the ration required per day for each 500 pounds live weight of hens in full laying, each hen weighing three to five pounds, would be approximately 27.5 pounds dry matter, 1.5 pounds ash, 5 pounds protein, 18.75 pounds carbohydrates and 1.75 pounds fat, having a nutritive ratio of 1 : 4.6. This would be an exceedingly stimulating ration. If we assume that this quantity and proportion of nutrients is correct, we can then compare it with the rations that follow. To do this it will be necessary to multiply the fat by two and one-quarter and add it to the carbohydrates, which would give 22.7 pounds total carbohydrates required each day.

RATION NO. 1. WELL BALANCED

	Cost	Dry Matter	Ash	Protein	Carbo-hydrates	Nutritive Ratio	Manurial Value
Two Pounds Corn Meal	.02500	1.78	.030	.158	1.528	1:9.8	.00652
Two Pounds Ground Oats...	.03700	1.78	.060	.184	1.136	1:6.2	.00756
Two Pounds Wheat Bran....	.02400	1.76	.116	.244	.906	1:3.7	.01236
Two Pounds Wheat Middlings.	.02500	1.76	.076	.256	1.214	1:4.7	.00942
Two Pounds Meat Scraps.....	.04400	1.78	.082	1.324	.622	1:0.5	.03500
Eight Pounds Corn.	.09600	7.12	.120	.632	6.112	1:9.7	.02608
Eight Pounds Wheat.....	.12240	7.20	.144	.816	5.840	1:7.2	.03408
Six Pounds Oats.....	.10500	5.34	.180	.552	3.408	1:6.2	.02268
Four Pounds Peas.....	.05200	3.60	.104	.672	2.136	1:3.2	.02192
Fifteen Pounds Mangel Beets...	.03750	1.95	.165	.165	1.560	1:5.1	.00765
Fifty-one Pounds.....	.56790	34.07	10.77	5.003	24.462	1:4.9	.18327

RATION NO. 2. TOO WIDE—TOO FATTENING

Kind of Grain	Cost	Dry Matter	Ash	Protein	Carbo-hydrates	Nutritive Ratio	Manurial Value
Two Pounds Corn Meal	.02500	1.78	.030	.158	1.528	1:9.7	.00652
Two Pounds Ground Barley	.03000	1.78	.048	.174	1.384	1:7.9	.00576
Two Pounds Wheat Middlings	.02500	1.76	.076	.256	1.214	1:4.7	.00942
Two Pounds Animal Meal	.03800	1.85	.390	.640	.460	1:0.7	.00250
Two Pounds Hominy Chops	.02300	1.78	.050	.150	1.410	1:9.4	.00632
Eight Pounds Corn	.09600	7.12	.120	.632	6.112	1:9.7	.02608
Eight Pounds Wheat	.12240	7.20	.144	.816	5.840	1:7.2	.03408
Six Pounds Barley	.08280	3.34	.144	.522	4.152	1:7.9	.01728
Four Pounds Buckwheat	.04400	3.48	.080	.308	2.132	1:6.9	.00988
Fifteen Pounds Potatoes	.06000	3.15	.150	.135	2.475	1:18.3	.01125
Fifty-one Pounds	.54620	33.24	12.32	3.791	26.707	1:7.0	.15159

It would take 67.3 pounds of Ration No. 2 to give the same amount of protein as 51 pounds of Ration No. 1—*i. e.*, 6.3 more food. If the fowls should eat this 67 pounds of Ration No. 2 they would consume 35.24 pounds carbohydrates, which would be 11.07 pounds more carbohydrates than they would consume in eating Ration No. 1.

RATION NO. 3. TOO NARROW—TOO STIMULATING

	Cost	Dry Matter	Ash	Protein	Carbo-hydrates	Nutritive Ratio	Manurial Value
Two Pounds Buckwheat Mids	.02000	1.74	.096	.440	.912	1:2.1	.00512
Two Pounds Ground Peas	.02900	1.80	.052	.336	1.068	1:3.2	.01096
Two Pounds Wheat Bran	.02400	1.76	.116	.244	.906	1:3.7	.01236
One Pound Gluten Meal	.01300	.92	.008	.258	.656	1:2.5	.00774
One Pound Oil Meal	.01450	.91	.053	.293	.485	1:1.7	.00960
One Pound Meat Scraps	.02200	.89	.041	.622	.311	1:0.5	.01750
Eight Pounds Peas	.10400	7.20	.208	1.344	4.272	1:3.2	.04384
Eight Pounds Oats	.14000	7.12	.240	.736	4.544	1:6.2	.03024
Ten Pounds Wheat	.15300	9.00	.180	1.020	7.300	1:7.2	.04260
Fifteen Pounds Mangels	.03750	1.95	.165	.165	1.560	1:5.1	.00765
Fifty Pounds	.55600	33.29	1.159	5.458	22.014	1:4.3	.18761

If the hens should eat all of Ration No. 3 they would consume 1.2 pounds *more protein* than would be needed, and at the same time would have 1.84 pounds less carbohydrates than they would require. The result would be that the protein would be burned up for fuel or transformed into fat, or would be assimilated, causing a plethoric condition.

Assuming that Ration No. 1 furnished protein and carbohydrates in the right quantity and proper proportion for the best egg-production, then we see that the extra 11.07 pounds of carbohydrates would either be used to make unnecessary fat or be wasted undigested. That is why it is

wasteful to feed too much fattening food, unless it happens to be enough cheaper as a source of protein to afford to let extra carbohydrates be wasted, which sometimes may be the case. But the feeder takes desperate chances of getting his stock too fat.

PRICES OF GRAIN USED IN CALCULATING COST OF RATIONS

	Per Pound	Per 100	Per Ton
Wheat	.01530	1.53	30.60
Corn	.01200	1.20	24.00
Oats	.01750	1.75	35.00
Barley	.01380	1.38	27.60
Buckwheat	.01100	1.10	22.00
Peas	.01300	1.30	26.00
Wheat Bran	.01200	1.20	24.00
Wheat Middlings	.01250	1.25	25.00
Oil Meal	.01450	1.45	29.00
Corn Meal	.01250	1.25	25.00
Gluten Meal	.00300	1.30	26.00
Hominy Chop	.01150	1.15	23.00
Ground Barley	.01500	1.50	30.00
Buckwheat Middlings	.01000	1.00	20.00
Pea Meal	.01400	1.40	28.00
Ground Oats	.01850	1.85	37.00
Meat Scraps	.02200	2.20	44.00
Animal Meal	.01900	1.90	38 00
Potatoes	.00400	.40	8.00
Beets	.00250	.25	5.00

It will be seen that the two rations that are richest in protein—*i. e.*, No. 1 and No. 3—are the most expensive to buy. From the standpoint of economy it does not pay to feed rations so deficient in carbohydrates that protein must be used for fuel. Ration No. 3 would have been much more expensive than Ration No. 1 if cheaper protein-rich by-products had not been used, which leads us to the importance at all times of figuring both the price and the composition of each food when making a ration.

Often many dollars may be saved by watching the market fluctuations. Sometimes corn is one of the most expensive foods, at other times oats are too dear to buy except in limited quantities for the sake of variety. The same may be said of wheat, buckwheat and other grains. All this time the composition of these grains remains practically constant. Therefore the careful feeder must not only know what food will give him the best results, but he must be ready at any time to take advantage of fluctuations in the price of grain and substitute an expensive source of food nutrients for a less expensive one.

The manurial value of foods should be considered. True, it is a secondary consideration, but if the poultry manure is carefully saved in the houses by the use of absorbents, and if forage crops are grown in the yards, so as to make good use of the droppings, considerable income will be derived, which may be used to offset a portion of the cost of the ration. For example, in the rations given the manurial value has been determined by allowing 15 cents per pound for the nitrogen, 5 cents per pound for the phosphoric acid and 4½ cents per pound for the potash. A portion of this value would of necessity be lost, because poultry manure loses its nitrogen very readily in the form of ammonia, and also by leaching.

Grain Foods

While fowls require both animal and vegetable foods in order to do their best, they are also grain eaters to a much greater extent. Their digestive tract is more especially adapted to the grinding and digesting of cereals, which they relish almost without exception, from the rich oil-bearing sunflower seed to the starch-grain corn and the protein-rich pea.

Grain Foods Arranged in Order of Total Digestible Protein Content in 100 Pounds

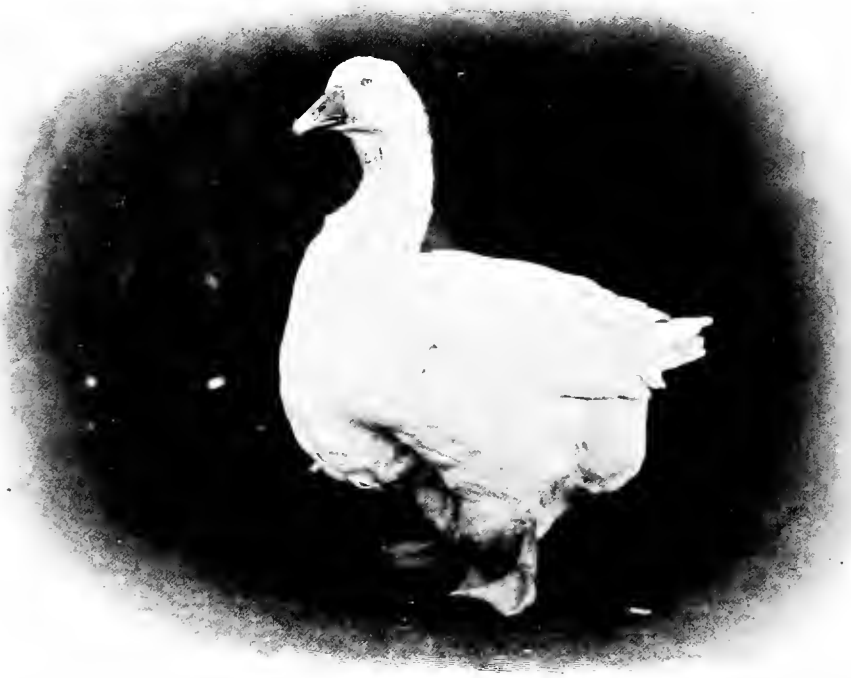
	Dry Matter	Ash, or Mineral Matter	Protein or Muscle-Maker	Total Carbo-hydrates. Fat-Formers	Nutritive Ratio. Prot.-Carb.	Manurial Value in 100 Pounds
Flaxseed	90.8	4.3	**20.6**	**82.3**	1:4	.657
Peas	90	2.6	**16.8**	**53.4**	1:3.2	.548
Sunflower Seed	92.5	2.6	**12.1**	**85.8**	1:7.1	.428
Wheat	90	1.80	**10.2**	**73**	1:7.2	.426
Rye	88	1.9	**9.9**	**70**	1:7.1	.329
Wheat Screenings	88.4	2.9	**9.8**	**55.9**	1:5.6	.462
Oats	89	3	**9.2**	**56.8**	1:6.2	.378
Millet	86	3.3	**8.9**	**52.2**	1:5.8	.365
Barley	89	2.4	**8.7**	**69.2**	1:7.9	.288
Corn	89	1.5	**7.9**	**76.4**	1:9.7	.326
Buckwheat	87	2	**7.7**	**53.3**	1:6.9	.247
Kaffir Corn	84.8	1.5	**7.8**	**63.2**	1:8.1	.....
Broom Corn	85.9	3.4	**7.4**	**54.8**	1:7.4	.2445
Sorghum Seed	87.2	2.1	**7**	**59.1**	1:8.4	.2814
Rice	87.6	.4	**4.8**	**72.9**	1:15.2	.1750

Wheat

It may be safely said that there is no better all-round grain for poultry than wheat. It has all the qualities of attractiveness of size, color, shape and freedom from undesirable covering or shuck. While it is a rich food,

its nutrients are quite well balanced—though perhaps a little more inclined to be a fattening food than one for the production of the greatest growth of muscle. While it contains more protein and more starch than corn, it contains less oil, and on the whole is not considered to be quite so valuable for fattening, but better for growth.

Wheat seems to give a lighter color to the yolk of eggs and to fat, and, according to meat packers in Chicago,* also gives redder color to the lean meat, than does corn. The by-products of wheat—the bran and middlings—are more valuable, pound for pound, than is the whole grain. Therefore it may be wise many times to sell wheat and buy bran and middlings.



From a photograph

MR F. G. S. RAWSON'S WHITE EMBDEN GOOSE
(One of two) First prize and cup at Birmingham. Bred by Mr. Harrison Weir

The great demand for the best grades of wheat for flour usually makes it too expensive to feed extensively to poultry, but there are grades of wheat that are perfectly sound and wholesome which, because they are

* Henry's feeding.

mixed with other grain, or because the kernels are shrunken, can not be used to make the best grades of flour, and therefore can be purchased at a reasonable price—so low, in fact, that it is often a more profitable food to buy than corn or oats.

Wheat screenings, if they are a good grade, can frequently be purchased and fed to good advantage. A good sample should contain more protein than oats, barley, corn or buckwheat, and about the same amount of carbohydrates as oats, peas or buckwheat. Of course there is always the objection of introducing weed-seed on the farm, but a large number of the seeds are eaten with a relish by the hens.

"Burnt wheat" should nearly always be shunned as one would a pestilence. The same is true of any other kind of musty or damaged grain. "Burnt wheat" is only a trade name for damaged, bunted grain, and is not, as might be inferred, simply charred by fire. Moreover, the difference in price between so called "burnt wheat" and good grades of uninjured "chicken wheat" is so slight that one should not hesitate an instant in making the choice for the latter.

Corn

Corn is the best relished by poultry of all the grains. It possesses four qualities that make it attractive to fowls: it has a bright color; its shape, size and texture are such that it can be easily swallowed; it is free from woody husk or integument; it contains a large amount of oil and sugar, which add attractiveness to flavor and ease of digestion. Moreover, it appears to satisfy the cravings of appetite and fulfil the bodily requirements, at least for the time. However, if fed alone or in large part it is too fattening in its nature to be the most desirable food for egg-production or for the growth of lean meat. Nevertheless, it should form a good part of all poultry rations, whether for young or adult, male or female, layers or sitters. This is especially true in the United States, where corn is "king" not only because of its goodness but because of its cheapness. From the analysis it will be seen that corn is actually the richest in the carbohydrate nutrients of any of our grains except sunflower seed and flaxseed, that it is a little weak in protein, and decidedly low in the mineral nutrients. Therefore it is most valuable when fed to mature animals for fattening purposes. And, conversely, it should be combined with foods rich in protein and ash when fed to animals producing muscle or eggs.

There is not much difference in actual feeding value between the dent and flint corns, as will be seen by the analysis. This is also true as between white and yellow corn.

It is not wise to feed corn and cob meal to poultry. The cob is very indigestible and contains about the same feeding value as oat straw. A better way to give bulk to the ration is by feeding something more nutritious, like wheat bran or cut clover hay.

One of the most pronounced and very valuable characteristics of corn is its power to impart to body-fat and the yolk of eggs a rich deep-yellow color.

In his experience in feeding poultry, George O. Brown, of Maryland, has found hominy chop very satisfactory. Regarding it he says: "It is especially suitable for laying hens and admirable for growing chickens. I would not undertake to keep chickens without it. In Baltimore it is known as hominy chop, and is sometimes called hominy meal. It comes from hominy, used as human food. The hard part of kiln-dried white corn forms the hominy, while the hulls, germ, a portion of the gluten, and starch, constitute 'hominy chop.' Recent analyses show hominy chop contains several per cent. less water than corn meal, fully two per cent. more protein, at least ten per cent. greater feeding value, and four per cent. more fat. Hominy chop usually sells for less than corn meal. It can be understood how valuable it is as a component ration for poultry where mixed food or mashes are used."

Oats

Good oats are good food for poultry. Light oats, that are often found on the market, are very undesirable. This difference is due to the varying proportions of hull and kernel in heavy and light oats. There is no grain so variable in weight per bushel as oats. Richardson is quoted by Henry as saying that the proportion of hull to kernel varies from twenty to forty per cent. of the total weight, and averages about thirty per cent. In the warm lower country, oats are light, with a large proportion of shuck; while in northern sections or on high altitudes they are solid and meaty. It will pay to get only the best, as will be found by noting the composition of oat shucks and the comparative proportion in heavy and light oats. It will be found that oat shucks have about the same feeding value as oat straw, and therefore contain such a large proportion of indigestible fiber

that it is a great tax upon the digestion of the fowls to handle it. Hens know this instinctively, and will refuse to eat light oats or the hulls if they can avoid it. It will be seen that oats contain less protein than wheat, sunflower seed or peas, but more than barley, corn or buckwheat; more carbohydrates than peas or buckwheat, and less than barley, rye, wheat or corn, and also more oil and twice as much mineral matter. They should usually form a part of the daily ration where the price will warrant.

"DOZING"

Practical feeders believe that the oat contains a stimulating virtue greater than other grains—which cannot be accounted for in its protein or carbohydrate content. On this point authorities are divided. Some chemists claim that an alkaloid called avenin is found in oats; others dispute that such a thing exists. While they are discussing the question it will be well to go right on feeding good oats liberally, both ground and unground. Owing to the extensive adulteration of ground oats by incorporating large quantities of oat hulls and light oats, it will be far more satisfactory to purchase the heavy oats and have them ground. Where hulled oats can be procured at a reasonable price they should prove a most satisfactory food, especially for the chickens that can not handle the shuck to good advantage.

Barley

Barley stands intermediate between oats and peas as a growing food and corn as a fattening food. It contains a little more protein than buckwheat and corn and a little less than oats, wheat or rye. But as it contains

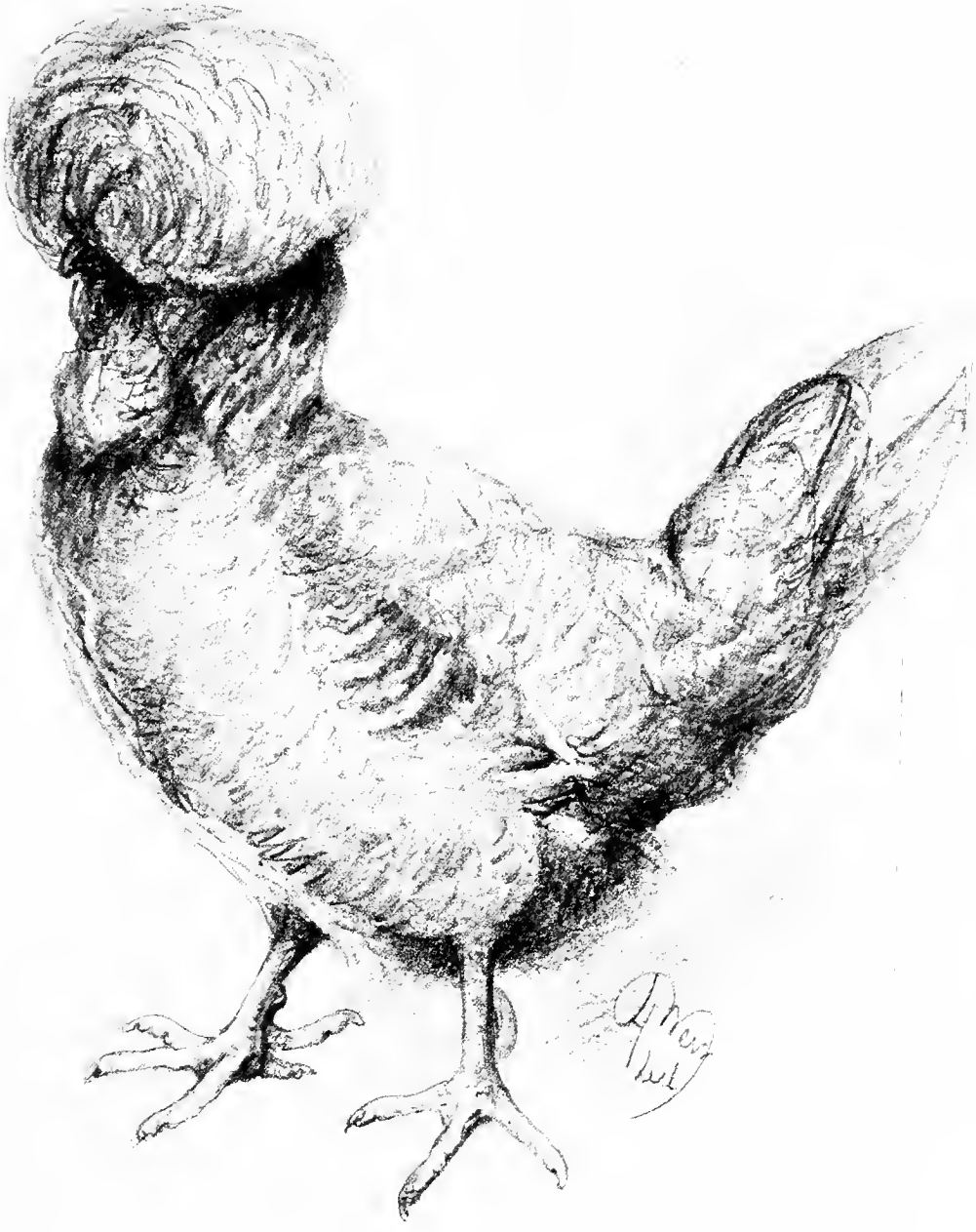
more of the carbohydrates than either oats, peas or buckwheat it becomes one of the richest and best of our grains for poultry. The shuck and beard are a little against it, the shuck being estimated at about fifteen per cent. of the total weight of the grain. The great demand for the best grades of barley for brewing tends to keep it out of the market for stock food by forcing the price a little high. Sound but discolored grain frequently can be purchased at a reasonable price. Avoid "ground barley" as it is sold upon the market. It is apt to be adulterated with various cheap fibers, ground corn-cob and the like, so that its feeding value often is less than one-half what good ground barley should be. Hens relish barley, and it can be fed liberally.

Buckwheat

Owing to the demand for buckwheat flower for human food, the price of buckwheat for stock food is usually too high to warrant buying it, except possibly in small quantities for sake of variety. Compared with other grains, it cannot be considered a rich food. It contains less protein and less carbohydrates than any of the common grains, and it is also low in mineral matter, containing about the same as corn, rye and wheat. The shuck, which envelops the kernel, is very tough and almost worthless as food. Buckwheat contains very little coloring matter, a fact very noticeable in the white flesh and light-colored yolks produced when buckwheat is largely fed. Hens like it when they once become accustomed to it, and inasmuch as it can be grown quickly as a second crop after grass or on poor land following a short fallow, it will often pay to raise and feed it, rather than to go to the expense and trouble of exchanging it for a richer grain. It has a nutritive ratio of one pound protein to 6.9 of carbohydrates, which is right between two of our best poultry grains—oats, with a nutritive ratio of 1 to 6.2, and wheat, 1 to 7.2. It may be considered a fattening food rather than one well adapted to produce growth.

Rye

Rye is not a success as a poultry food. Why, no one seems able to satisfactorily explain. Surely it cannot be accounted for in its composition. Rye is richer in protein than oats, barley, corn or buckwheat, and richer in carbohydrates than barley, oats, peas or buckwheat. It does not contain any objectionable hull, like oats, barley and buckwheat, but still hens do not seem to like it. While it is deficient in ash, it is no more so than wheat or corn, both of which fowls relish. It is possible that it con-



ORDINARY MODERN SHOW HOUDAN

tains some objectionable flavor or medicinal property. Perhaps it is only a whim. However that may be, it will be just as well to let the hens have their way, and raise or buy grains that they like better than rye.

By-Products and Hay Arranged in the Order of Total Digestible Protein Content per 100 Pounds

	Dry Matter	Ash, or Bone- and Shell-Maker	Protein, or Muscle-Maker	Total Carbo-hydrates. Fat-Formers	Nutritive Ratio. Prot.-Carb.	Manurial Value in 100 Pounds
O. P. Oil Meal	91.	5.3	**29.3**	**48.5**	1:1.7	.960
Gluten Meal	92.	.8	**25.8**	**65.6**	1:2.5	.774
Buckwheat Middlings	87.	4.8	**22.**	**45.6**	1:2.1	.256
Gluten Feed	92.	1.1	**19.4**	**63.3**	1:3.3	....
Wheat Middlings	88.	3.8	**12.8**	**60.7**	1:4.7	.471
Wheat Bran	88.	5.8	**12.2**	**45.3**	1:3.7	.618
Alfalfa Hay	92.	7.4	**11.**	**42.3**	1:3.8	.431
Hominy Chops	89.	2.5	**7.5**	**70.5**	1:9.4	.316
Corn Bran	90.9	1.3	**7.4**	**70.1**	1:9.4	.335
Red-Clover Hay	85.	6.2	**6.8**	**69.6**	1:5.8	.329
Oat Hulls	90.6	6.7	**1.3**	**41.5**	1:31.8	.113

Wheat Bran

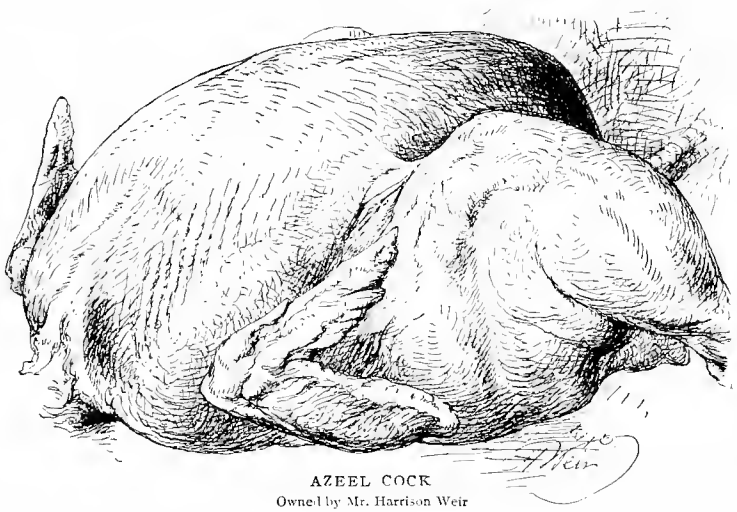
Wheat bran, it is safe to say, is the safest, best and most universal all-round natural by-product food which we have. It is not as rich in protein, to be sure, as gluten feed, gluten meal, oil meal or the best grades of wheat or buckwheat middlings, but it contains more mineral matter than any of the named foods, and is the best food to add bulk to the ration so that the stomach juices can act readily upon it. Good bran is richer in protein than oats, but does not contain as much starch or oil. On the whole, good ground oats are worth a little more, pound for pound, for general feeding, than good bran. There is a great difference in the quality of bran, owing to the grades of wheat and milling process. In the centre of the wheat is the flour, which is largely starch. The outside shell, the bran, contains a large amount of protein, mineral matter and fiber. Between the flour and the bran is a layer of gluten—a form of protein—some of which gets in with the good bran; a little goes along with the flour, but more is found with the middlings, which, as its name implies, is from the middle—*i. e.*, between the bran and flour. The difference in quality of bran, then, largely depends upon how thin the outside shuck is taken off and how much of the gluten is retained.

The best way to learn to judge bran is to secure a number of samples and prices from a wholesale dealer and compare them. A good test is to chew

a handful, and if it is fine and dry and refuses to gather, but remains dry and loose, look out for it. If it chews up into a nice "cud," it indicates gluten. That is the kind which makes eggs.

Middlings

The great value of the various kinds of middlings lies in the large amount of protein, largely in the form of gluten, which they contain, and to the fact that when they are mixed with such dry, crumbly foods as corn meal, gluten meal, wheat bran and the like, an adhesive, sticky principle is added which when mixed with other grains makes them more attractive to fowls. There is a wide variation in the quality of middlings. Some kinds apparently are nothing more than ground bran and floor sweepings; other grades are mostly flour. Middlings contain very little crude fiber—in which respect they are very like corn meal and gluten meal. Wheat middlings is the kind most largely used, but buckwheat middlings is far richer, and in sections where buckwheat mills are found the latter is usually the more profitable kind to buy.



AZEEL COCK
Owned by Mr. Harrison Weir

Gluten Products

There are many kinds of gluten products. They are all by-products from the corn-starch factories, and they vary widely in composition and price. It is never safe to buy them except upon a guaranteed analysis. Gluten feed is the whole of the corn by-product. It contains all the corn except the starch, which has been removed. Gluten meal is the same as gluten feed less the hull and germ, and therefore is more concentrated. Corn bran simply consists of corn hulls—the outside shuck from the

kernel of corn—and therefore is very bulky and not very rich. Corn germ is concentrated and exceedingly rich in protein and oil. With all gluten products, as with all other by-products, they should only be fed in limited quantities and in connection with natural grains. Their cheapness often makes their use desirable.

Linseed Meal

Linseed meal is a product of the manufacture of oil from flaxseed. While it is extensively heralded as the best food to feed to hens during the molting period, and while we know that it is the most important ingredient in most of the condimental foods and condition powders, it should be fed only in limited quantity, because, first, hens do not like it; and, second, it contains an excessively large amount of mucilaginous material, making the ration exceedingly sticky, which causes the food to wad up in the crop; and, third, it is such a rich, concentrated protein food that there will be danger of over-feeding. It contains more protein than any other grain food except cottonseed meal. One hundred pounds of oil meal contains about as much protein as 287 pounds of wheat, 318 pounds of oats, 370 pounds of corn, 380 pounds of buckwheat or 610 pounds of rice. It is rich also in mineral matter, containing nearly as much ash as wheat bran or clover hay and about two or three times as much as most of the grains. It is a laxative food, and if fed too liberally will cause bowel trouble. Generally it will not be necessary or wise to feed more than one-fifteenth by weight of the total ration fed per day.

Cottonseed Meal

While this is one of the richest and cheapest of all stock foods, it is not a safe one to feed to poultry in large quantity. We do not feed it at all. Hens do not take to it kindly. It is constipating in its nature.

Meat Foods Arranged in the Order of Total Digestible Protein Content Per 110 Pounds

	Dry Matter	Ash, or Bone- and Shell-Maker	Protein or Muscle-Maker	Total Carbohydrates. Fat-Former	Nutritive Ratio. Prot.-Carb.	Manurial Value in 100 Pounds
Meat Scraps*	89.3	4.1	66.2	31.1	1:0.5	1.75
Meat Scraps*	94.6	1.5	53.	68.	1:1.3	.....
Dried Blood	91.5	4.7	52.3	5.6	1:0.1	2.128
Dried Fish	89.2	39.2	44.1	23.2	1:0.5	1.772
Animal Meal	92.7	19.5	32.	23.	1:0.7	.....
Fresh-cut Bone	65.8	11.5	18.	43.	1:5.3	.....
Buttermilk	9.9	.7	3.9	6.5	1:3.7	.088
Skim Milk	9.4	.7	2.9	5.9	1:4.5	.103

*Both analyses are given to show how variable meat products really are.

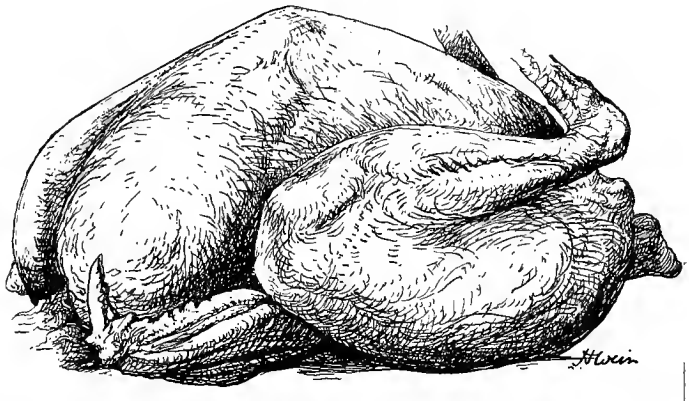
Meat Foods

Hens are meat eaters. They are natural scavengers—worm and insect hunters. It has long been commonly believed that hens would lay better and that chickens would grow faster and with greater profit when fed meat in some form. That has now been quite satisfactorily proven by Professor Wheeler, of the Geneva, N. Y., Experiment Station. From his experiments it would seem that we are justified in thinking that protein in meat is more valuable than protein in any other form of food, and that for fowls meat is a necessity. In fact, I believe that meat in some form is the most important one food that can be fed to stimulate the ovaries into activity and to increase the secretion of albumen. And because of this fact it must be fed judiciously, particularly to young pullets that we do not care to force into premature laying, or to hens in which for any reason we desire to retard egg production. The amount of meat that it is safe to feed will depend entirely upon its kind and composition. The accompanying tables show how the various meat products vary in this respect. The prepared meat products in the market should never be bought except upon a guaranteed analysis. They vary in their protein content from twenty-five per cent. to sixty-five per cent., and some brands of meat scraps and dried blood are even richer in protein.

There is also a great difference in the amount of fat which they contain. And the same may be said as to the mineral elements. Generally it may be said that the meals have less protein and less fat but more mineral matter than the meat scraps. It should be remembered that while the mineral matter which represents bone is valuable as a source of lime for the egg-shell and to make bone, it might be purchased for much less in cracked oyster shell at $10 per ton than in the meat meals at $40 to $50 per ton; and that fat, while having a fuel and fattening value, can be bought for less money in other forms. The protein is the element that we are particularly after when we buy meat in any form, and upon its protein content we should for the most part base its value. Fat and mineral matter we usually get in sufficient quantity in most foods as we buy them.

If we compare meat scraps that contain sixty per cent. protein at $45 per ton with meat meal containing thirty per cent. protein, and green cut bone with fourteen per cent. protein, and skim milk containing 3.5 per cent. protein, then the meat meal would be worth $22.50 per ton, green cut bone $15 per ton, and skim milk $2.60 per ton. In this reckoning we

should take into account the palatability of the various forms of meat. It would seem that in this respect the skim milk and green cut bone would have the advantage over the prepared meals and scraps, provided the latter were fresh and wholesome, which is not always the case, particularly during hot weather. It must also be said that frequently the meat meal and scraps are tainted and absolutely unfit to feed. The same brand varies in this respect. Meat foods must be kept dry. If they get wet they heat and ferment. Sometimes it would seem that the trouble is caused by the use of undesirable slaughter-house refuse. Any meal that hens will not eat with a relish when they once become accustomed to it should not be fed. A good way to test the wholesomeness of any food is to pour boiling water upon it. If the odor arising immediately therefrom is musty or putrid, shun it.



RED-SPANGLED DORKING COCKEREL
6½ months old. Weight (ready for cooking), 5¾ lbs. Bred by Mr. Harrison Weir

VEGETABLE FOODS ARRANGED IN THE ORDER OF THEIR TOTAL DIGESTIBLE PROTEIN CONTENT IN 100 POUNDS

	Dry Matter	Ash, or Bone- and Shell-Maker	Protein, or Muscle-Makers	Total Carbo-hydrates, or Fat-Formers	Nutritive Ratio. Prot.-Carb.	Manurial Value in 100 Pounds
Red Clover, Green	29.	2.1	**2.9**	**16.4**	1:5.6	.107
Cabbage	15.	1.4	**1.8**	**9.1**	1:5.1	.082
Rape	14.	2.	**1.5**	**8.6**	1:5.4	.092
Mangel Beets	13.	1.1	**1.1**	**10.4**	1:5.1	.051
Turnips	9.5	.8	**1.**	**7.65**	1:7.7	.050
Potatoes	21.	1.	**.9**	**16.5**	1:18.3	.075

VEGETABLE FOODS AND FEEDING

Fowls are vegetable eaters. They are natural grazers, though not to the same extent as ducks and geese. We surely do not fully appreciate the part that good pasture plays in the feeding and good health of poultry. Greater attention should be paid to it. At present, most flocks that do not

have the freedom of the farm are kept in yards much too small and which in many instances are devoid of all forms of vegetation. Not only is this wrong from the standpoint of economy, but it is dangerous from the hygienic point of view.

Poultry yards should be made to pay a revenue in the green forage that they grow, which will at the same time purify the soil by transforming what would have become filth and dangerous impurity into wholesome food product. This may be brought about in two ways. The runs may be utilized to grow forage crops, or they may be seeded down to permanent pasture. The former has the advantage of aerating the soil and letting in the sunlight to purify it. The permanent pasture has the disadvantage that it will "run out." This is particularly true in spots near the buildings. Most kinds of poultry graze too close on portions of pasture, and let the other parts go to seed, where the runs are large.

Rye is a good crop for very late fall and early spring forage, because it will germinate and grow in very cold weather and will live through the winter. Its weakness is that it gets tough very quickly when warm weather comes.

Oats and peas sown together very thinly, with a liberal seeding of red clover and a very little rape, make a good combination. The oats and peas furnish a rapid growth of green food, a good deal of which will get tramped down and some will go to seed, but it will serve to protect the clover and rape, which will make good food for late summer and fall pasturage. Three pecks of oats, two pecks of peas, one pint of rape seed and five quarts of red clover seed will be a good proportion for seeding. The oats and peas should first be harrowed in deeply, then the clover and rape seed should be mixed and sown, then lightly scratched in with a weeder.

This system can best be employed by having double yards, one of which can furnish forage while the other is getting started. With a single range, if it is large, a good stand should be obtained except near the houses. But the hens should not be turned on until after the grain has come up.

Green food is equally important for winter feeding. It should be fed both raw and cooked. The best vegetable for feeding raw, so far as our experience goes, is the mangel beet. It is sweet, tender, juicy and nutritious, and does not impart any objectionable flavor or odor to the eggs or flesh as some other vegetables, like onions and cabbage, are apt to do if fed in too large quantity. Cabbage is very much relished, and may be fed for variety.

Turnips are perhaps the most satisfactory as cooked vegetables. The objectionable flavor is largely driven off by the cooking and the fowls have an especial fondness for them. They are apt to be a little tough and strong when fed raw. Other factors in their favor is that they can be grown so cheaply. We sow them as a catch crop after early potatoes, or in the corn at the last cultivation. Clover is sown with the turnip to seed the ground, so that about all the turnips cost is the labor of harvesting.

Little potatoes can be used to good advantage. Like turnips, they are much improved by boiling. The two go well together. Even a very few onions will be found valuable to add variety and palatability to the ration. The onion has splendid medicinal qualities, and can be fed quite liberally to young chickens with excellent results. The table shows the comparative value of the most important green foods. It will be seen that when arranged in the order of richness in protein they will be red clover (green), cabbage, rape, mangels, turnips, potatoes. But when arranged in the order of their richness in carbohydrates they will be potatoes, red clover (green), mangels, cabbage, rape, turnips. And when arranged in order of richness in mineral nutrients they will be red clover (green), rape, cabbage, mangels, potatoes, turnips. From these comparisons it will be noted that, so far as protein and mineral nutrients are concerned, red clover (green), rape, cabbage and mangels head the list, and that for carbohydrates, potatoes, red clover and mangels are in the lead.

Grit and Mineral Matter

Grit is to the fowl what teeth are to the ruminating animal—a necessity. They must have it if rapid and perfect digestion is to take place. It is reasonable to believe that fowls will get more value out of food when they are provided with grinding material. Therefore it will be economy to provide it. Hard, irregular grit is best, because the action of the gizzard in grinding is a crushing process. When the particles of grit become round and smooth they are expelled and other grit is eaten to take its place. To make sure that fowls have enough grit it should be kept where they can help themselves at will. An incidental value of grit, though a very important one, is the mineral nutrients which it contains. The various forms of grit on the market vary largely in this respect, according to the nature of the rock from which they are made. It will be seen that the cracked oyster shell or clean sea shells are particularly valuable in this respect.

From a sketch by Harrison Weir

OLD KENT AND SUSSEX BLACK-BREASTED RED BARN-DOOR COCK

They are rich in carbonate of lime, and are so easily broken up by the action of the gizzard that the mineral matter seems to be almost immediately available. They will have an effect on the hardness of the egg-shells within a few days. The reason for this quick transformation will be apparent by noting the great similarity in composition between egg-shells and oyster shells.

The most potent cause of hens eating their eggs is a lack of the mineral elements in their system to make the egg-shell. When their bodies lack this element they naturally crave it, and are ravenously hungry for it. Their instinct tells them that the egg-shell contains the material to satisfy this craving; they therefore eat it. After learning what is inside the egg,

they know a good thing when they see it, and may then develop the egg-eating habit. Several times I have seen whole flocks of hens, where nearly all of them seemed to be eating their eggs, cured by simply providing sufficient mineral matter in the form of cracked oyster shells, mortar, or the like.

When hens lay but few eggs, the grain, meat and vegetables will usually furnish sufficient mineral matter. But for hens that lay almost continuously for long periods additional mineral matter must be provided.

The various kinds of sea shells not only contain the mineral foods, but they apparently have a salty flavor which the fowls relish. This, together with hunger for grinding material, will cause fowls that have been long deprived of grit to eat it as freely and as ravenously as they would grain. This need of mineral matter of the right kind and proper proportion undoubtedly has much to do with the bad results with growing chickens, or hens kept too long away from the soil. In the sod soil in which they delight it is possible that they find the one thing which the system craves and which our foods lack. This lack of mineral constituents is manifestly one of the dangers of too liberal feeding of some of the grain by-products which in their manufacture have had much of the ash removed.

Condimental Foods

Salt assists in the digestion of foods, particularly those that are excessively rich in protein. Nearly every food in its natural condition contains some salt—enough, usually, for the needs of the fowls. When fowls are being fed a forcing ration it is well to feed a little salt to season it and make it palatable. It will be safe to feed one-half pound of salt to one hundred pounds of food.

It was found by Professor Wheeler that a much larger amount of salt could be fed without injury, but it does not follow that it would be advisable to feed that amount. Whether or not evil results will follow the eating of salt will depend upon the kind of salt and how it is fed. When eaten in too large quantities it acts as a poison and will cause death. Fowls that have died from eating salt have usually mistaken coarse salt for grit and in that way have eaten too much.

Charcoal has a great absorbtive power for gases, impurities and acids. It acts as a corrective when the stomach is sour and digestion has been impaired—and is not a food. Sometimes fowls eat it freely, at other times

they will not touch it. Let the fowls be the judge; they seem to understand when it is required. Keep it where they can help themselves.

Red pepper is a stimulant. It acts as a tonic. It surely warms up and tones up the system. Like all other stimulants, it should be fed rarely and moderately or evil results will follow. To fowls having colds or roup, or for stimulating hens into egg-production, a little red pepper is desirable.

Water

Water is as necessary to digestion as food itself. Many foods contain enough water for their own digestion. This is true of vegetables. But with the grains and dry meat products, particularly those that are excessively rich in protein, much additional water will be required for perfect digestion. Water is needed in the blood to float the solids and in the muscles and bones to carry on nutrition and growth.

It is the common carrier of the body, and is largely used in all the secretions. The egg, which is a combination of three separate and distinct secretions, contains a large amount of water, as will be seen from the analyses.

Professor Wheeler has estimated that one dozen eggs contain one pint of water. It must be apparent from either a practical or a theoretical point of view that hens must have water other than that found in their food in order to keep in perfect health.

Many a flock of fowls that are otherwise quite well cared for go about with dark combs and dull feathers because they do not have enough water to carry on digestion and supply their bodily wants. Common observation proves this to be true. A flock of fifty hens in good laying will require four to six quarts of water a day. This should be kept where they can help themselves whenever they desire it. They can not fill up, like a cow or horse, and go all day. They have no place to carry water in quantity. They take a little water at a time, whenever they need it to moisten the food in their crop so that it may soften up and pass on freely to the gizzard to be ground. Hens usually drink before going to roost and the first thing in the morning. The only way to make sure that they always have enough water is to supply it in a receptacle so large that it will never be empty.

It would naturally follow that pure water is of as much importance as wholesome food. Disease or disorder is frequently the direct result of fowls drinking dirty, stagnant water, particularly if it is their own filth that

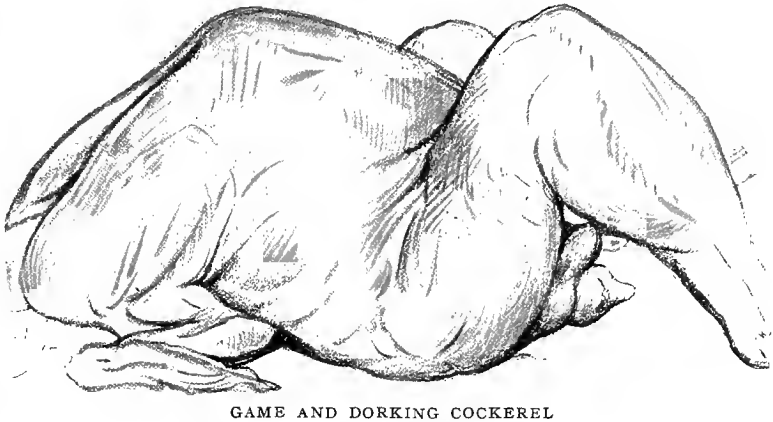
is the source of contamination. Unfortunately, the hen is not the most cleanly bird, which makes it doubly important to take special care to keep things clean.

During very cold weather it is a good plan to provide warm water in the morning. It helps to warm the fowls, and does not act as an emetic, as it does with most animals, because they drink so little at a time. If fowls are allowed to become abnormally thirsty they may drink too freely, which is apt to result quickly in looseness of bowels, which is another reason why water should be kept always on hand.

Palatability

Aside from their actual composition, foods have a value due to their flavor and medicinal qualities, which act beneficially or injuriously upon animals.

This perhaps accounts for the fact that hens prefer some foods to others of similar composition even to the extent of refusing to eat certain kinds of grain. And strange to say, the foods they like the best may not always be the ones that will give the best results in egg-production. For example: they like corn perhaps better than other grains, but if allowed to eat it too freely will become too fat to lay well, and in the end will suffer in health. They do not like rye and they do like wheat, yet the two are quite similar in composition and appearance.



GAME AND DORKING COCKEREL
Weight, 7½ lbs.; trussed, 5¾ lbs.

A preference for certain grains is often a matter of habit. If fowls have been accustomed to certain kinds of grain, they do not take kindly at first to other kinds. Hens that have never eaten peas or buckwheat will be pretty sure to refuse them at first.

The same is true of corn and all other grains. However, they gradually become accustomed to a new food, and if it agrees with them will soon learn to eat it with avidity.

It is important to feed only those foods that fowls really like when they once become familiar with them. Palatability has much to do with digestion. Experiments with other animals have proven that when they have been forced to eat that which was unattractive or distasteful to them it was digested improperly. If the food pleased the palate the fact was instantly communicated to the digestive glands of the mouth and stomach, which stimulate the secretions even before the food reaches them. Foods not palatable did not cause this secretion, hence improper digestion followed.

Variety

Variety in diet helps to increase palatability. It is therefore better to feed a mixture of grains all of which fowls like than it is to feed any one kind of grain, no matter how good it may be. The reason is twofold. Not only will the fowl have a better chance to get a ration best suited to her particular needs, thus in a measure balancing her own ration, but she will also have a variety from day to day to break the monotony of sameness that always comes from eating any single food. The main organ of taste, the palate, the watch dog of the stomach, becomes deadened by constant tasting of the same food, just as the sense of smell becomes dulled when compelled to inhale the same odors for any great length of time. Distaste for food is Nature's way of indicating that the system has enough of that particular thing. That is one reason why we prefer to feed a mixture of grain at one feeding rather than to feed a single grain for a time and then change to another.

If the grains are similar in composition, such change from time to time will prove beneficial, but any radical change in diet may derange digestion and retard egg-production.

Cooked *vs.* Uncooked Food

It may be said in a general way that cooking food for poultry does not pay. However, with some foods cooking does pay. This is particularly true of some vegetables, such as potatoes and turnips, both of which, in the raw state, are not particularly attractive to hens (unless they can steal them). When they are boiled they are much relished. This may be due to

the fact that starchy foods are rendered more digestible by virtue of the cracking of the starch grains, or it may be because they are made more palatable, or both. Fowls seem to prefer cooked meat to the raw article, which is rather surprising in view of the fact that hens in nature get their animal food raw, and also in face of the general belief that cooking albumin coagulates it, which renders it less digestible. It would seem that hens, like people, have civilized tastes, and that palatability plays a more important part with lower animals than is generally supposed.

Even if cooking poultry foods rendered them more digestible in all cases, the question of labor and expense would still have to be considered. In fact, it is this item perhaps more than any other which makes it undesirable to cook the ground food for the hot mash.

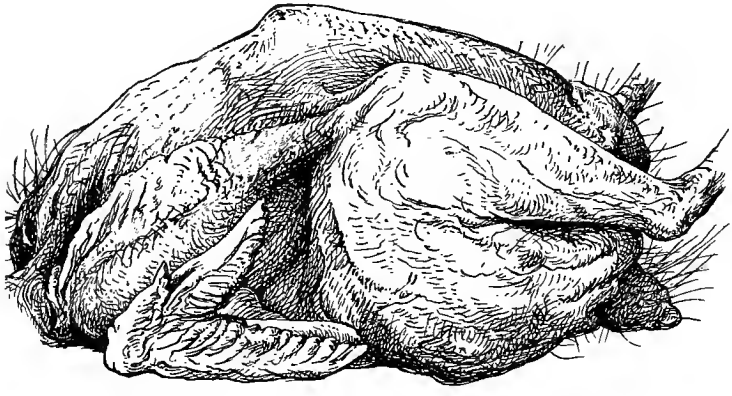
Scalding the ground food answers the purpose of giving something hot and apparently improves its flavor, but it should be mixed quickly and fed immediately or be kept closely covered, so that the natural, attractive aroma may not escape. The instant that scalding or boiling takes place the characteristic odors and flavors that render most foods attractive are driven off. If this occurs and the food is allowed to stand, much of the charm of attractiveness is lost.

Our plan is to boil a kettleful of mixed vegetables and bones from the butcher's with the kettle closely covered. When thoroughly cooked, this is put into a mixing-tub and thoroughly mashed. Then ground grain is added until the mixture becomes dry and crumbly, when it is fed immediately. Experience will very quickly indicate the proportion of vegetables and grain, and also how much of the mixture will be needed for a feeding. No rule can be given, so much depends upon the nature of the grain mixture and the kind of vegetables used, and upon the appetites of the fowls.

How Much and How Often to Feed

How much to feed is more important than how often; but the time and method of feeding has much to do with success. This is true whether we are feeding for eggs or for growth or for fat. In their natural state fowls rustle and hunt for most of their food. It is gathered a little at a time and held in the crop until a convenient opportunity for grinding, digesting and assimilating. It is much the same as a cow foraging until her paunch is filled, when she quietly rests and chews her cud. It is probable that some grinding and digesting is done while the hen is foraging, but it seems

quite evident that the larger part of the digestive and assimilative process takes place when the body is quiet, particularly at night. The gizzard works by the involuntary muscles, as do the heart and lungs, whether the fowls are asleep or awake. A hen does not lie awake to grind her food. In fact, it is probable that the grinding and digesting process takes place most rapidly and most completely during sleep, as is the case with other animals. From this it will be seen that the fowl can adjust herself readily to the slow accumulation of food or to a rapid filling of the crop, because this organ is intended to regulate the rapidity of digestion. The crop is the hopper or the supply sack to carry the surplus. It works both by voluntary and involuntary muscles, and is wholly under the control of the fowl. When the system craves more nourishment the fowl lets more food pass from the crop through a small stomach where the gastric juice is secreted. The food then passes to the gizzard, where it is crushed into a fine semiliquid condition, and is forced on into the intestines, where digestion continues and assimilation and absorption takes place. With this explanation, it will be easy to see that the hen can adjust herself to varied conditions. Nevertheless, it pays to be regular in habits of feeding. Where fowls are confined to houses or small yards this is more important than where they have free range and can forage for part of their living, because while at liberty if the regular feeding should fail the appetite could easily be appeased by foraging. From the standpoint of exercise and happiness on the part of the hen, frequent feeding is better than heavy feeding once or twice a day. Little and often is a good rule, particularly with the heavier breeds, where exercise



From a drawing by Harriton Weir

DORKING AND WYANDOTTE—CORNISH INDIAN
Skin thin and flesh white and of good texture

is of great importance to keep them from becoming too fat and to avoid overfeeding. However, the element of labor always enters in, and we find that for most purposes feeding three times a day is the most satisfactory.

The hen is an early riser and likes to begin work as soon as she can see. The first meal should be fine grain. We want the hens to work. They are usually more inclined to do this in the morning than at any other time of the day. This is because the crop has been emptied during the night and the food most likely digested and assimilated. They will then have both an empty crop and a good sharp appetite as an incentive to work. It is important, also, that they exercise in the morning, because that is usually the coldest part of the day, and the activity will keep the body warm and will stimulate a good appetite for dinner, particularly if the morning feed has been a little light, which should always be the case.

If the soft food were to be fed in the morning, as used to be the almost universal custom, the fowls would fill up quickly, and the food, not having to wait to be ground, would pass on quickly to be digested and thus to satisfy hunger. This would satisfy the appetite and destroy the incentive to forage. The hens would most likely stand around on one foot or squat down and rest perfectly contented. Hens will not work just to keep warm. Exercise must be impelled by appetite. If the hens have been properly fed in the morning with only a light feeding, they will come hungry for dinner, which should be fed early.

At noon is the time to give them all they will eat up clean within fifteen to twenty minutes. If less is given, it is possible that some timid or slow-eating fowls will not get enough. If so much is fed that they are all the afternoon eating it, they may get too much of the rich, easily digested concentrated food and be overstimulated, or have their digestion overtaxed, which would surely result in less eggs. There is not as much danger of this if the soft food contains considerable bulky material, as it should, such as cut clover hay, wheat bran or ground oats. Moreover, where soft mash stands very long it loses flavor, and in winter becomes cold and in summer quickly sours. This is apt to cause trouble.

At night, hens should be given all the whole grain that they can eat. It is better to have a little left over than not to have enough. This feeding should be done early enough so that the hens will have time before dark to find the grain in the straw litter. This grain feeding will usually be all ground up by the digestive organs before morning.

If the soft food should be fed at night, it would pass too quickly into circulation, and the gizzard would not have its natural amount of work to do during the night.

Balancing Their Own Rations

If a variety of grains, including all the principal ones commonly used for poultry, are thrown where fowls can have their choice, they will usually eat the corn first.

If the sense of taste, which indicates the fowls' likes and dislikes, were a correct and safe criterion by which to judge food best suited to the fowls' needs, surely corn would be the universal poultry food. But this is not so. The appetite is simply the signboard to digestion, and it does not hang out its danger signal until there has been an accident and there is occasion for it. Digestion learns by experience. The warning may come too late, so far as health and profitable production are concerned. The fowls' estimate of a good food is the kind that tastes good, digests easily and permits a little surplus energy (fat) to be accumulated. That, with a fowl, is contentment.

Let this lazy contentment continue and there comes a time when the body is overstocked with fat, a derangement of digestion takes place and the appetite rebels against the food that once it craved. The same phenomena takes place where an animal, spurred on by an unusual appetite, eats more of any kind of food than it can digest. The system becomes overcharged with the particular nutrient with which the food abounds and that food becomes repulsive.

One experience like this may never be forgotten, and as a result that food may never again be relished. The chief difficulty, then, of giving fowls unlimited access to food, is that the danger is reached before the warning comes. Another is, that one of the best incentives to good health, which is exercise, is lost or at least impaired. Still another reason is that food which an animal sees and smells continuously loses much of its attractiveness. The senses of sight and smell also have much to do with perfect digestion, as has been proven by a recent experiment in which a dog was allowed to see and smell food which it liked but was not allowed to eat. Examination of the digestive tract showed that great quantities of digestive juices had been secreted preparatory to digestion which had been anticipated. When the nerve had been cut which had connected the digestive glands with the senses of sight, smell and taste no secretion of digestive fluid

took place. Therefore we can readily understand why seeing and smelling things which are very much relished aids digestion and makes the "mouth water." Constant excitation of the senses deadens them and thus impairs their effectiveness. Less danger will occur where fowls have constant access to whole grain or very bulky food than where much rich stimulating soft ground food is supplied, for the apparent reason that with the coarse, hard food much more time will be required to soften and grind it, and therefore the amount that can be eaten will be limited. Even then fowls are almost certain to become too fat. This is particularly true of hens not in laying.

From a drawing by Harrison Weir

FAT WILD DUCK (MALLARD)
Bred by Mr. Harrison Weir

Whole Grain *vs.* Ground Feed

Where we desire to push the hens to the largest possible egg-production, regardless of fertility or vigor of the germ, about or nearly one-half of the grain food should be fed ground. This is because the hens cannot grind the whole grain fast enough to make eggs as rapidly as they would if part of the grain were ground for them. It will pay to do this grinding. Engine power is cheaper than hand power. It may be said also in favor of feeding ground food that the hen requires food to grind food. Anything that requires effort—motion—whether it is inside or outside the body, takes energy. These two facts found good proof in the experiments by Professor

W. P. Wheeler, who found that Leghorn hens having a ration in which the grain was whole consumed on the average for two years more than twenty per cent. more food for the same egg-production than did similar hens having half the grain in their ration ground and moistened.

The hens having the whole grain had on the average for two years 6.4 pounds of water-free food for every pound of eggs produced. Those having ground grain had on the average for two years 5.3 pounds of water-free food for every pound of eggs produced—a difference of 1.1 pounds of water-free food for each pound of eggs. Possibly it may be asked why not then feed more ground food and get still more eggs? That would probably be wise if the largest number of eggs were desired for a very short period—which is not usually the case. Under such forced feeding upon concentrated foods it is more than likely that the result eventually would be indigestion, which would result in retarding egg-production. The ultimate effect would depend much upon the nature of the soft food. If it were composed largely of the bulky food, such as bran, ground oats and cut clover, the result would be much the same as if all whole grain had been fed. It would make digestion slow, and the danger of giving too much soft food would be decreased. Great caution must be used when feeding such rich concentrated foods as meat scraps, middlings, gluten and oil meals, corn meal and the like—which are fine in texture and deficient in fiber.

Exercise

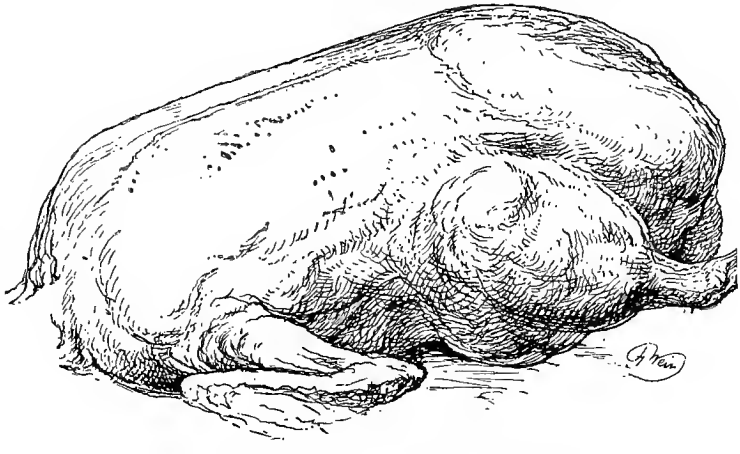
Nearly all poultry-keepers believe that exercise is an important factor in egg-production. It would seem that there must be some truth in this general belief. I believe there is, and that it is found in the fact that activity of the ovaries is very largely dependent upon the physical vigor of the fowl, and that exercise is an essential to physical vigor. By it fowls strengthen their vitality and increase all their bodily functions, including purification of the blood by better breathing and elimination of impurities through the secretions from the kidneys. Activity of respiration increases combustion in the lungs, which warms the body. Therefore, the busy hen will be warmer than the one that stands around with nothing to do.

This is an important consideration in cold weather. It is to be expected that all this exercise will burn up food nutrients and thus increase the appetite, for that exercise increases the appetite is a self-evident truth. This is a sign of good health and always precedes good egg-production.

The extra cost of food is no argument against exercise if by it the fowls keep in better health and are stimulated to higher production.

Another argument in favor of exercise is that fowls are made happy by being allowed to indulge their natural instinct to hunt and scratch. So pronounced is this characteristic that little chickens a day old will scratch industriously for food on a bare table where there is no excuse for so doing. It is born in them. They enjoy it. The best way to start hens to singing is to give them something to do. A singing hen is apt to be a laying hen.

When the cold weather comes another law asserts itself. The animal instinctively avoids exertion. The physical activities of the hybernating animal become almost dormant. This same tendency is noticed with poultry, though in a less marked degree. They are simply following the dictates of a natural law, which is that activity, either physical or mental, uses up energy, which is the result of heat, which is derived from the fat in the body or direct from nutrients in the food. Thus we find hybernating animals coming out of winter quarters spring-poor, having used up the fuel stored up in the fall—in spite of the fact that they have been husbanding their energies—just the same as a fireman short of coal would economize his fuel. The hen does the same. She does it intuitively. The difficulty of overcoming this inherited tendency is one of the reasons why it is so hard to make hens lay well while the days are getting shorter and the weather colder.



A GOOD BUT SMALL COMMON GOOSE
Weight 10 lbs.

The all-important problem of the poultryman is not so much the husbanding of energies or the saving of food as it is the getting of eggs and the keeping of his fowls in the best possible health.

*Begun in Part III.—By James E. Rice, New York.

Therefore, the first object for the poultryman to overcome is the inactive, conserving tendency in his fowls. He must do this even at the expense of greater food-consumption if he wishes to force egg-production.

Temperature and Food-Consumption

It is apparent that fowls which are kept in cold houses will require more of the food nutrients than will those which are kept warm. However, the part of the food—the carbohydrates—which is used for the purpose is the least expensive of the food nutrients and is usually found in sufficient quantities in most of our grains. Inasmuch as it is the same nutrient that is required to make fat in the animal, it naturally follows that animals already fat will suffer less during exposure than fowls not fat. It is the natural tendency of all animal life to prepare for this emergency, and therefore as cold weather approaches the body fortifies itself by storing up fat. At such times the appetite naturally craves those foods that will most readily make fat. This increased appetite and the readiness to fatten as cold weather approaches is recognized by feeders of all animals, and is one reason why it is so difficult to keep hens from becoming too fat for good egg-production at this time of year. It is the natural instinct of all animals to go into winter quarters "hog-fat."

Feeding According to Age

Mature fowls not laying eat less in proportion to live weight than do those that are young. This is because the mature fowls have only to maintain their bodies, while young stock not only maintain the growth already made but they must have the food to make new growth. The table * here given shows the relative amount of food required per day for each 100 pounds live weight with chickens of different ages. It illustrates most aptly the point in question.

Rations for Chicks

	Total Dry Matter lbs.	Ash lbs.	Protein lbs.	Carboh. lbs.	Fat lbs.
For first two weeks	10.1	.5	2.0	7.2	.4
From 2 to 4 weeks of age	9.6	.7	2.2	6.2	.5
" 4 to 6 " "	8.6	.6	2.0	5.6	.4
" 6 to 8 " "	7.4	.5	1.6	4.9	.4
" 8 to 10 " "	6.4	.5	1.2	4.4	.3
" 10 to 12 " "	5.4	.4	1.0	3.7	.3

* W. P. Wheeler, Geneva, N. Y., Experiment Station.

The digestive apparatus of young animals is larger than of the adult, in proportion to their live weight, which is a physiological explanation of their rapid growth in proportion to their live weight.

As the fowls become older their tendency to throw their energies into fat rather than into eggs or muscle increases. Therefore it is not profitable, as a rule, to keep fowls after the second year—except in case of exceptionally good ones, which of course should be retained as breeders.

Feeding Pullets

The aim in feeding pullets from the time the sex can be distinguished until they have reached the proper period of maturity to lay is to keep them growing as rapidly as possible without forcing them to premature production. This is a fine point and a difficult one—particularly with the breeds that have the egg-producing tendency largely developed.

If the food is too easily digested and too stimulating and fed too liberally the pullets will be stimulated to lay before they have reached the proper size, which would check their growth and perhaps injure foreve what should have been the most prolific layers in the flock. On the other hand, if the food is too indigestible or too deficient in growth material or too sparingly fed they will not get sufficient nourishment to make a normal growth. This latter condition occurs more often by far than the former, but both should be guarded against. To avoid too stimulating a diet, feed meat sparingly and concentrated ground feed but once a day. Plenty of range—good mixture of whole grain, like wheat, oats, barley, peas and corn. To avoid too slow development, guard against feeding too largely on fattening foods, like corn, buckwheat, etc. See to it that all the flock have enough to eat three times a day. When feeding ground food there should not be too much bulk.

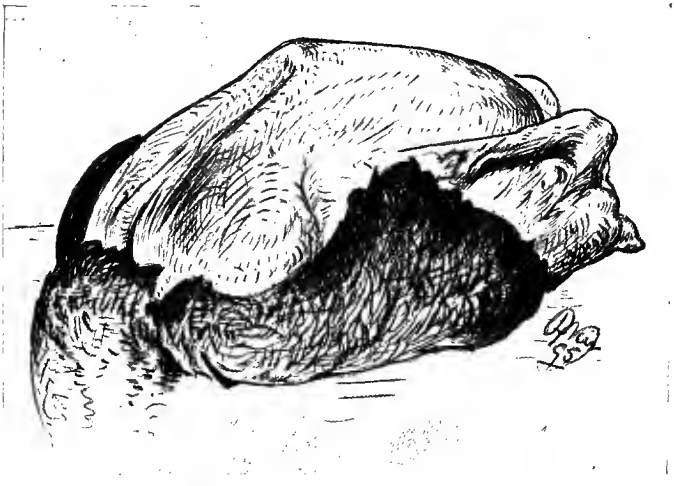
Feeding Different Breeds

Generally speaking, the ration that will give the best results with one breed of fowls will not in the long run be the one that will give most satisfactory returns when fed to dissimilar breeds.

On general principles, it may be accepted that the same food nutrients that go to make eggs, meat or fat in one breed will do the same in all breeds, but that they are not required in similar proportion. This is because the element of heredity enters into the problem and the inherited tendencies of the breed assert themselves. That is why the same ration will make

a Leghorn produce eggs while an Indian game produces meat; a young fowl grow muscle and an old fowl grow fat.

In the first case, the tendency is inborn to throw its food into reproduction; in the second, the inherited tendency is to throw its energies into expansion; in the third, the tendency toward muscular development asserts itself; while in the fourth case, this tendency having reached its limit, the food nutrients are then naturally enough stored up as a reserve force in the form of fat. That is why it is difficult to fatten young stock, and why it is almost impossible to keep mature stock from becoming too fat when fed liberally. So strong are these tendencies asserted that the mature animal will actually convert the food nutrients into fat which with a young animal would have naturally gone to make muscle or eggs. So, too, one breed inherits an active, industrious disposition and works off its energies, while a fowl of another breed having a phlegmatic disposition stores up its energies, being too good-natured and lazy to use them. Therefore it becomes necessary to feed fowls of different ages and different breeds on rations best suited to develop or counteract these tendencies, as may be desired. If we want a breed to lay that is naturally inclined to become fat, we must feed foods containing less of the fattening nutrients—*i. e.*, a narrower ration—and make them work to use up fat which may be stored.



CORNISH INDIAN AND LANGSHAN
A good fowl

If they are of the active disposition that naturally works off their fat, they can be fed more of the fattening nutrients with safety—*i. e.*, a wider ration. In fact, it is imperative that we pay close attention to the disposition of the fowls if they are to be kept fat enough to do well.

The problem, then, of getting the best net results in egg-production with heavy breeds is how to give enough food to enable them to lay well without getting them too fat. To do this we may have to sacrifice something in cost of food, because the narrower ration costs more than the wider one. Protein is more expensive than carbohydrates. The following result of an experiment is a case in point:

Cochin hens having a whole grain ration laid much better than those having the ground grain, while with the Leghorns those that had part soft feed laid best. The better results from feeding whole grain to Cochins was very likely due to the fact that they were compelled to exercise more to get their food, and, having to do all their own grinding, were prevented from becoming too fat—the fat nutrients being used up in the work of grinding and scratching.

It must be apparent, then, how impossible it is to get the best results from egg-production where the breeds are mixed up miscellaneously and the same ration and treatment given all.

Feeding Breeding Stock

The greatest care should be exercised in feeding the fowls that are to perpetuate their kind. While it is the natural law of all plant and animal life that the parent will sacrifice its own body to the last extremity in order to make a perfect offspring, nevertheless there comes a time when the body can no longer furnish the materials in the right quantity and proportion to perform its natural office and reproduce vigorous, perfect offspring. This fact is clearly shown in the analysis made by Professor Harry Snyder of eggs from hens fed by the writer upon rations that were radically different

PRIZE FAVEROLLE (EX) ANCEAUMA
Shown at Islington. 3½ months old. Very fat

in composition; one being very deficient in protein, called the carbonaceous ration, the other being deficient in carbohydrates, called the nitrogenous ration. Surely such wide differences in the composition of the eggs would result in wide differences as to the development and vitality of the chickens.

Analysis of Eggs from the Two Rations

White of Egg Contained	Nitrogenous Ration *Per cent.*	Carbonaceous Ration *Per cent.*	Yolk of Egg Contained	Nitrogenous Ration *Per cent.*	Carbonaceous Ration *Per cent.*
Water	92.08	90.22	Water	44.47	41.60
Nitrogen in dry substance	14.23	13.71	Nitrogen in dry substance	4.90	4.97
Protein	88.92	85.69	Protein	30.62	30.83
Fat	0.53	0.64	Fat	64.43	64.78
			Shell	8.69	8.48

It will be wise generally to not push for eggs the hens that are to be used for breeders during the early winter months. It will pay in the long run to sacrifice something in egg-production for the sake of increased vigor and vitality in the chickens. It seems pretty well demonstrated that fowls that have been laying rapidly and continuously for a long period previous to the breeding season will not give eggs that will hatch as many or as strong chickens as fowls that have not been forced up to the breeding season. It is perhaps largely for this reason that hens are usually more satisfactory as breeders than pullets. Hens in comparison to pullets usually lay but few eggs during the fall and early winter. In order to hold back the breeding stock it will be wise to feed them almost entirely on whole grain, only a little meat and plenty of vegetables. Or if much soft ground food is fed it should be very bulky in its make-up. The activity of the gizzard and slow digestion will help to keep the fowls from being over-forced or becoming too fat. For the same reason plenty of exercise in the fresh air should be encouraged.

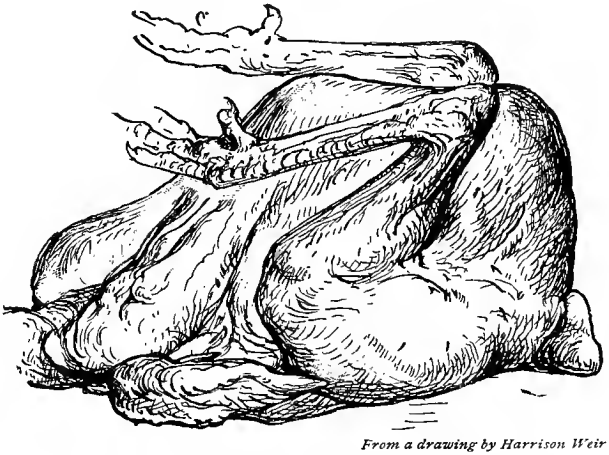
Feeding Sitting Hens

Sitting hens should be as well fed as those that are laying, but the feeding should be different. Grain should be left where they can get it whenever they desire to come off the nest. This is done not only as a matter of convenience, but also to insure the hens getting all they want to eat, and also to get them in the habit of coming off regularly, which they will be more apt to do if they know the food is always obtainable. It is better to feed all whole grain in good variety, such as corn, oats and wheat. The reason is that all the food a sitting hen requires is for her bodily maintenance.

She is a non-producer, and will therefore be able to satisfy her needs without soft food, vegetables or meat, though a little of these will be a benefit. The danger lies in feeding so much vegetable food as to loosen the bowels, or in feeding so much meat as to stimulate a desire to discontinue sitting and go to laying.

Breaking Up Broody Hens

The problem in feeding broody hens is twofold: we want to break up the desire for incubation, and get the fowls to laying again as soon as possible. If it were simply to do the former, starving them or ducking them in the water-trough might be sufficient diversion to take their mind from the natural inclination to sit. This treatment, however, would delay rather than promote that state of physical vigor and nerve strength necessary to egg-production.



From a drawing by Harrison Weir

FAT MONGREL FOWL

Shown at Islington. Showing fat accumulation about neck and lower part of breast

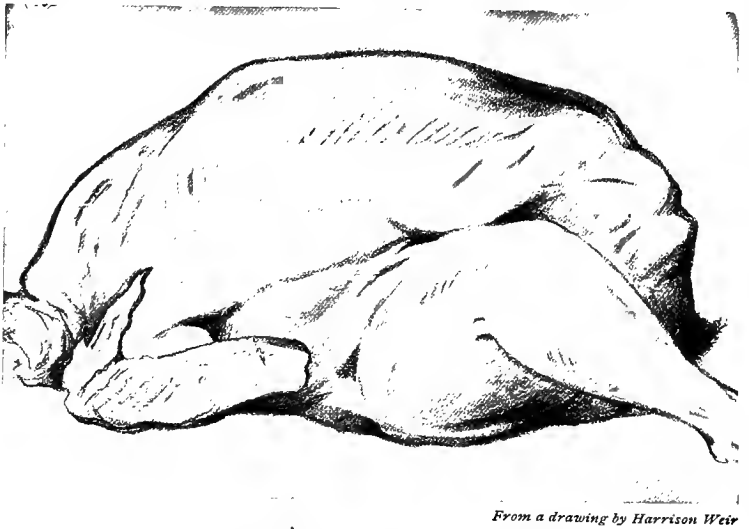
After a period of laying the fowl is in a condition of nerve exhaustion. This may and may not mean fat exhaustion. Because very often broody hens are overfat. When in this state they are not in the best physical condition. The same is also true of the hen poor in flesh. Manifestly the best way to get a hen to lay is the best way to break up the broody desire. That is to say, if she is too fat, feed abundantly on easily digestible food rich in protein and mineral matter. If she is poor in condition, more fattening food like corn should be added. As a matter of practice, it will be found impractical to bother to feed broody hens differently from the laying fowls unless it appears that the broody hens are radically different in their condition and a special effort is being made to get the largest possible net results regardless of time and expense—the point to be emphasized being the importance of liberal feeding instead of a starvation treatment in the handling of broody hens. It is important also that the hens be taken from the

nests as soon as they manifest a desire to sit, because the desire seems to become stronger if they are allowed to remain on the nest several days. Grit, water and both whole grain and soft mash should be provided. It is our practice to let the broody hens out after three or four days' confinement. A few of the hens will return to the nest and must be recaught. We think it wiser to do this than to keep the others cooped up unnecessarily.

Feeding Molting Hens

The molting period of fowls is a critical time in their lives. In nature they seek seclusion because they are in a somewhat defenseless condition—both as to their ability to escape from natural enemies and their power to withstand inclement weather. Therefore in domestication they manifest the same disposition, and must be given special care as to food and shelter.

The time and manner of molting is largely a question of inheritance; various conditions of age, production and food may affect the natural inherited tendency so as to hasten or retard the molting process. Normally hens of the same age and breed would shed their feathers at about the same time, providing other conditions were equal. But fowls that are early hatched will have reached a condition of maturity proportionately earlier than those that are hatched late, consequently they will have performed their normal annual life work of growth, egg- and feather production, after which will follow rest, recuperation and a new coat of feathers. Most fowls begin life during the warm spring months both in nature and in domesti-



From a drawing by Harrison Weir

MISS CROAD'S LANGSHAN PRIZE PULLET
Note the shortness of thigh and leg. A fine sample

cation. They will then naturally fulfil their life work of reproduction at about the same time, and if conditions are favorable they will take their rest and renew their coats and be ready for winter before it arrives. But when we change the conditions by hatching exceedingly early and then very late, even extending the time to fall hatching, we find a difference in conditions of maturity and a consequent difference in time of molting. When we add to this a system of feeding intended to prolong the egg-production late into the fall, or, in contrast to this, a system of neglect or improper feeding on fattening foods, we find potent factors which most emphatically influence the time and manner of molt.

It may be well to here inquire what constitutes a healthy molt. On this point poultrymen do not agree. My own belief is, that a natural, healthy molt is one where a rapid growth of new feathers takes the place of the old ones as fast as they drop, and where certain feathers are naturally shed while others wait until some of the new feathers are well grown, which is a condition that never permits a fowl to be nude or decidedly ragged.

The molt where all or most of the feathers are shed before the new coat comes on is not the most healthy molt. It is not in accordance with the natural laws. In nature, all bird kind quietly drops a few feathers and replaces them before other feathers fall, so that at no time will it be unable to flee from a pursuer or be unprotected during a storm.

A careful study of molting hens will reveal the fact that a very fat fowl will shed its feathers and will not have the power to renew its coat, and that a very poor fowl will not be able to shed its coat. The best condition for a healthy molt is to be found between these two extremes. In other words, the best molt occurs when the fowl is in the best possible health, having completed its year of egg- and feather production.

The feathers lose life and vitality when the ducts which nourish them have done their season's work. This exhaustion may be brought about prematurely by physical or nerve exhaustion, either through heavy laying, by sickness, or by starvation.

This is according to common observation in the case of fever in the human family, when the hair is apt to fall out, or where pullets completing their first period of laying will molt even in the dead of winter. A restoration to health by generous feeding will start a new coat.

In a healthy animal, the glands will work, and unless there are live,

healthy feathers there to take the nourishment supplied, new ones will start, as is shown by the cases where persons preparing fowls for exhibition have plucked their feathers and so timed them that a new coat is grown complete in time for the show.

While it is apparent that the molting process is somewhat under the control of man, the practical question to be asked is, whether or not it is desirable to force a molt. All producers of fall and winter eggs know that the hardest time of all the year to get hens to lay is during the months of October, November and December, and that the hens that lay best during these months are usually the ones that have molted early. The practice of forcing an early molt by a starvation process, so that the fowls throw their feathers in a bunch, is receiving wide publicity and trial. With what success, time only will reveal.

I venture the suggestion that it will be wiser and more profitable to let the hens lay while they will under normal conditions rather than stop them in order to force a molt. One will have to take desperate chances to get them to lay again much sooner than they ordinarily would, particularly if as radical a means as starvation rations is used to compel the molt. Would it not be wiser to depend more largely upon early hatched pullets to keep up the early winter egg-supply, and simply cut out the forcing diet from the hens during late summer, and continue to feed good, wholesome whole grain for maintenance and good health?

The rational ration for hens during their molt will depend upon their condition. If they are poor after a long period of laying, a food rich in oil, with a moderate amount of protein, will be best; oats and sunflower and flaxseed are the best examples of foods that are rich in oil and not deficient in protein. If the fowls are fat, a ration rich in protein will supply the material to grow a new coat of feathers better than one which has a tendency to fatten. Old-process oil meal, wheat bran, meat meal, skim milk and clover meal are the best examples of feather-making foods. It will be seen by the analysis of feathers that they contain a large proportion of nitrogen, and therefore must have a ration rich in protein in order to make the growth.*

Feeding Chickens

Young chickens should be fed little and often. The great danger in feeding chickens up to the time they are feathered is from overfeeding.

*Van Dreser's Molting Art.

MALAY PULLET

It occurs far more frequently than does underfeeding. Overfeeding is more apt to occur with brooder chickens that have little chance to exercise than it does with chickens that run with the hen. There is far less danger of over-

feeding with whole or cracked food than there is when all ground food is fed, for the reason that digestion must take place more slowly.

It therefore follows that as between hard and soft food, where both are fed, the larger the proportion of ground food the chickens eat the faster they will grow; and conversely, the larger the proportion of cracked or whole grain they eat the slower they will grow and the less will be the dangers from digestion troubles.

It really becomes a question of seeing how fast we can grow them without "feeding them off their feet"—which means without injuring their digestion. Most feeders will prefer to keep on the side of safety, and not try to force them too fast.

The first food should be given about twenty-four hours after hatching has been completed. The yolk sack, which has been enclosed within the body a few hours before hatching began, contains all the food that is required until the digestive system is in working order. The mistake sometimes is made of leaving the chickens so long without nourishment that they are weakened—but the mistake is more apt to be made in the other direction. Hens pay more attention to keeping their little ones warm than they do to hunting for a big dinner. We should do the same.

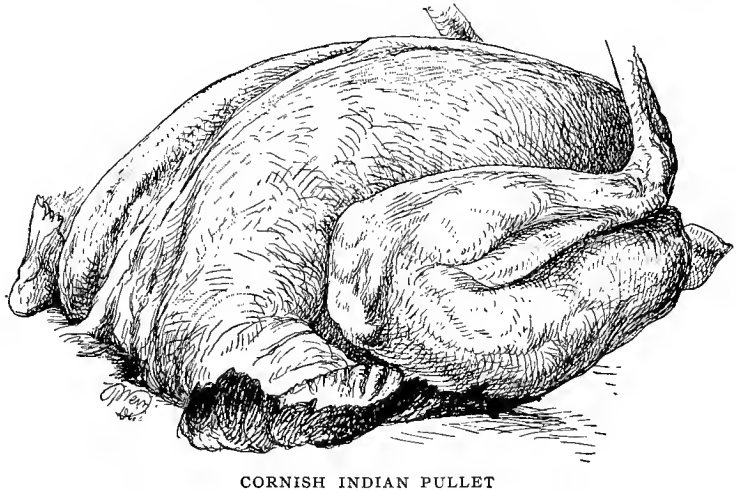
The best results that we have ever had in raising little chickens was when we fed wheat bread soaked in skim milk—squeezed dry and fed crumbled—for the first day or two. For the next few days this was supplemented with fine cracked grain, principally wheat and oatmeal. I think a large variety of seeds and fine grain is an advantage. They can be purchased in quantities of poultry supply houses and a mixture made to suit conditions. Several combinations of these grains are upon the market which we have found very valuable. We have had well-grounded suspicions that a good deal more grit is often put in these foods than is really necessary. The feeding table on another page gives the composition of many foods that may be used for chick feed.

All whole or cracked grain should be fed in a litter of chaff, where the chickens will have to scratch for it, if they are confined. This should form the first and last feeding of the day.

During the day they should be given what they will eat up clean of soft food, which should be dry and crumbly. After four weeks this soft food may be fed quite liberally.

The best combination which we have ever found is to make a corn-meal

"Johnny cake," by mixing sour milk and soda to make it light. It must be thoroughly cooked all the way through. If it is sodden or only partly baked it is a dangerous food. When taken from the oven it should be covered with a damp cloth so that it will steam and soften. With this should be mixed a little pot-cheese or custard. The custard is made by adding half a dozen infertile eggs to a quart or two of milk and the whole beaten thoroughly and placed in the oven and allowed to cook by slow heat. This custard takes the place of meat, which in some form is a necessity in feeding chickens. No kind of grain or vegetable can take its place. If custard is not fed, some kind of meat must be provided, such as green cut bone, fresh meat—which is better cooked—or meat scraps, which may be sifted and the coarser particles mixed with grain, about one-tenth to one-fifth weight. If skim milk is to be had, it can be fed freely as a drink or in the form of pot-cheese—or both.



CORNISH INDIAN PULLET
Bred by Mr. W. Brent

If the chickens cannot get to grass, green food of some kind must be provided. The best vegetable for little chickens is lettuce. Cabbage is also very satisfactory. Chopped onions or onion tops in small quantity are particularly healthful.

Finely cracked grit is a necessity from the start. It should be mixed and scattered with the fine grain at first. It should also be kept in a box where they can help themselves at all times.

In case of sour stomach, which is indicated by gas or water in the crop, feed some charcoal. In fact, it is a good plan to have some of it where the chickens can help themselves.

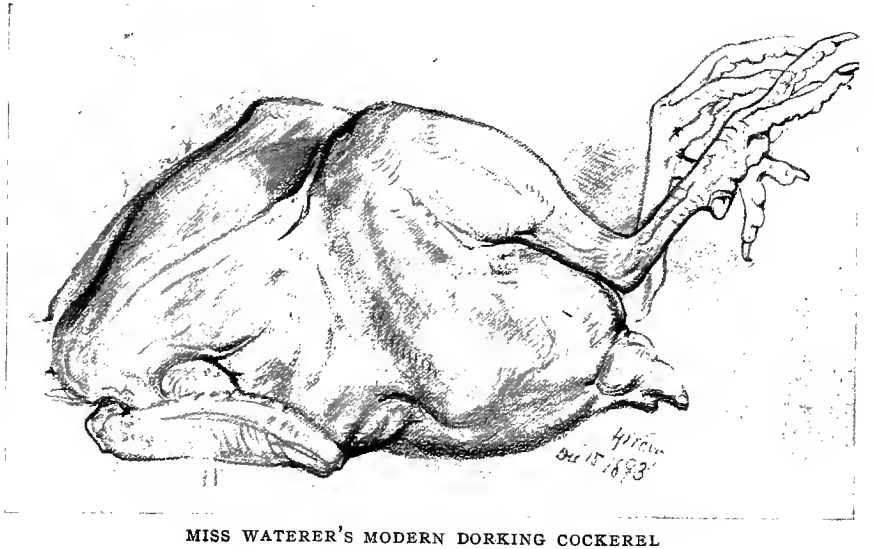
Water should be given from the start, but always in such a dish that

the little ones cannot get wet. Use large fountains that can be taken apart and thoroughly cleaned and scalded if necessary.

The great danger in watering chickens is that the dishes will not hold enough. When chickens get out of water they get too thirsty, and then drink too much when it is supplied them.

The six things to keep in mind when raising chickens are:

First, keep them warm.
Second, keep them dry.
Third, keep them clean.
Fourth, keep them busy.
Fifth, keep them hungry.
Sixth, keep them growing.



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The Poultry Book

By

HARRISON WEIR, F.R.H.S.

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This book has been revised and partly rewritten from the American point of view by American experts.

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MILLER PURVIS, Illinois

"Conditions in the United States"
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By the EDITOR

* Continued from Part III

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By courtesy New York Duck Farm *Photograph furnished by Miller Purvis*

PEKIN DUCKS ON LONG ISLAND

FINISHING FOWLS FOR MARKET

MILLER PURVIS, ILLINOIS

"Though in our work we often fail,
The way we finish tells the tale."—CAREW.

IT is not uncommon for the poultry dealer to find a large number of fat fowls among those he gathers from the farms, but it is a comparatively rare thing to find finished ones, and it is the finishing of poultry that determines the class to which it belongs. While a fat fowl may sell well and bring the highest open quotation, the perfectly finished one will bring the fancy prices that are paid by those consumers who are willing to pay extra for extra quality.

It is comparatively easy to feed a lot of fowls until they are very fat, yet such fowls may not be finished in the real sense of the word as applied to poultry prepared in the best manner for the market. It is quite easy to feed a flock of fowls that have entire liberty until they are loaded with fat, and yet they may lack in flavor, and when brought to table may present anything but an appetizing appearance.

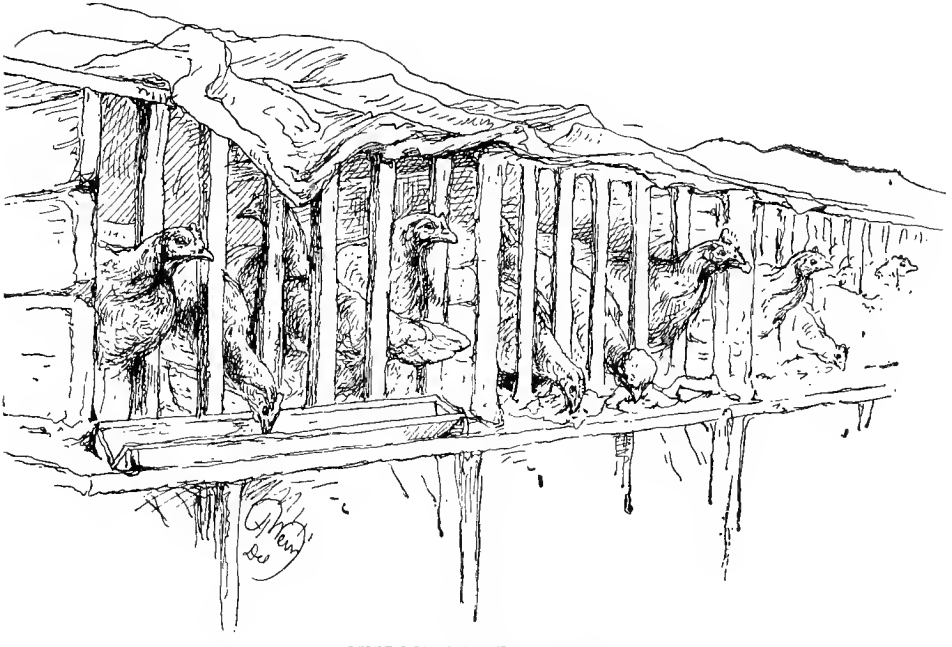
The poultry consumers of this country do not recognize the difference between a fowl that has been simply fattened and one that has been properly finished as readily as do the consumers of England, France and other European nations, because they have not been educated up to the point of realizing how much better the finished fowl is than the merely fat one. The fat fowl has its fat distributed on the intestines and immediately under the skin, while the finished one will have the fat distributed among the fibers of the flesh in very small globules. In the process of cooking, the fat in the fat fowl will melt and run out into the cooking vessel, leaving the flesh hard or stringy according to the way it is cooked, and lacking that delicious flavor that belongs to the flesh of fowls properly finished, while the flesh of the finished fowl comes to the table sweet, juicy and tender.

To fatten a fowl it is only necessary to give it all the corn or other grain it will eat and water to drink, and pay no more attention to it. Such a fowl will sell readily in the American market; but our great poultry-packing firms soon learned that when such fowls were exported the consumers rejected them as not being first-class, and they immediately began to study European methods, and up to this time no method has been discovered that is superior to those which have been followed in the old country for centuries. Some improvements have been made in the manner of handling the fowls, and the rations have been slightly modified, but in the main the processes followed are those of the old country, and in more than one instance men have been brought from abroad to inaugurate European systems of finishing in this country. Because fattening fowls requires no special skill, and can be done by any one who knows enough to throw corn out of a corn-crib with a scoop shovel, we have devoted this chapter to the finishing of fowls.

Perhaps the importance of this final finish may be made more clear by relating the instance in the experience of the writer. We were going through one of the largest poultry-packing plants in this country with the manager, observing the methods in use and inquiring into the magnitude of the business, when it occurred to us to ask him how much difference there was in fowls merely fattened and those properly finished. For reply he took us into a storeroom where some thousands of fowls were disposed on racks before being packed. Putting his hand on one rack he said: "Here is a lot of birds that came from Arkansas. They are just ordinary mongrels,

but have been well fed. To-day these birds are worth nine cents a pound, just as you see them."

Going over to another lot, where an inspector was engaged in sorting the fowls before they were packed for shipment, he said: "Here is a lot of birds that were bought in Iowa and finished in our place here. They were mostly Plymouth Rocks and Wyandottes, well fattened on the farm and finished by ourselves. They are worth sixteen cents a pound to-day,



OUTDOOR FATTENING PENS

but I wouldn't thank any man to give me that price for them, for I can export them and get more out of them."

We then asked him if he would pay the difference in value between fowls that were simply fattened and those that were properly finished if the poultry raisers would take pains to finish their poultry. He said he probably could not afford to do so unless such finishing became common enough to make it possible to buy poultry in large lots at first hands. This is the substance of several conversations we have had with extensive poultry buyers—those who do business amounting to hundreds of thousands of dollars every year.

The advantage of properly finished poultry is becoming well under-

stood in Canada. Canadian poultry breeders haye created a great demand for their product by sending to England poultry finished in every sense of the word and as English consumers have been educated to expect it to be. Already in America several private plants are producing finished poultry for market and creating a demand that must have a beneficial effect on the general practice in this country.

It is the opinion of the managers of the great poultry-finishing plants in this country that Plymouth Rocks and Wyandottes are the most profitable breeds for the high-class markets. They recommend those from whom they buy their supplies to breed these and their grades. The Indian Game fowl has a good many friends, but does not seem to be making any headway, and the Asiatic breeds have fallen behind in the race for popularity. The Orpingtons have recently been introduced, and are gaining ground very rapidly, and the desire to secure them amounts to almost a furore in some parts of the country. They promise to become very popular for exporting, as they have the white skin desired by foreign consumers.

The smaller breeds, such as the Mediterranean varieties, the Polish and the Hamburgs, are not esteemed for market purposes, and do not finish in a satisfactory manner. They are kept principally for eggs. Of the French breeds, the Houdan is oftenest seen, but these are not numerous enough to make any showing in the poultry market, although they are beyond a doubt very desirable table fowls. A very few Dorkings are kept in this country, and these mostly by fanciers who are not interested in market poultry. While they are among the best table fowls, they are not prolific layers and do not meet the American demand for a general-purpose fowl. The Orpingtons, having a Dorking cross and also a cross of blood from the distinctively laying breeds, are rapidly taking the place of the other English breeds, as they are very good layers as well as good market fowls.

Mr. Weir says, "All very short- and close-feathered birds, as a rule, though fine in flesh, are not rapid in fattening; in some cases they will not fatten on the breast at all, though abundantly so on the back, etc." A fowl, to be really good and the breast meat rich and mellow, must fatten on that part; otherwise, however deep and full of flesh the breast is, it will be dry and to a certain extent hard, and especially if it is to be served as cold fowl. Therefore, those birds that fatten evenly, with a close, square, well-fleshed form, prove of the highest quality. A long-breasted bird is not so good, as there is never the depth of flesh, though it is longer; still, the

slice that can be cut from the one is no heavier than from the other, while the shorter is usually the richest in flavor. The long breast is a modern mistake.

When fowls or chickens have a capacity to fatten they may be brought to this condition by being kept in grass enclosures and fed liberally three times a day—in the morning, at seven, on corn-meal or barley meal and oatmeal, mixed and moistened with scalding skim milk, or water if milk can not be had; at twelve, on scalded wheat and rice mixed; lastly, on ground buckwheat and ground oats mixed, moistened with scalding skim milk; or they may have a trough, replenished twice a day, to go to as they are inclined. In this way, when of the age of four to six months, they make fine and very richly flavored fowls. Or if a grass run is not available, the birds must be put into a room or coops, but the small runs are preferable, and the birds are better flavored and at the same time firmer and more healthy in their flesh. In all cases grit or fine gravel should be put in the food when it is mixed, the sexes separated, and punctuality as to the time of feeding observed.

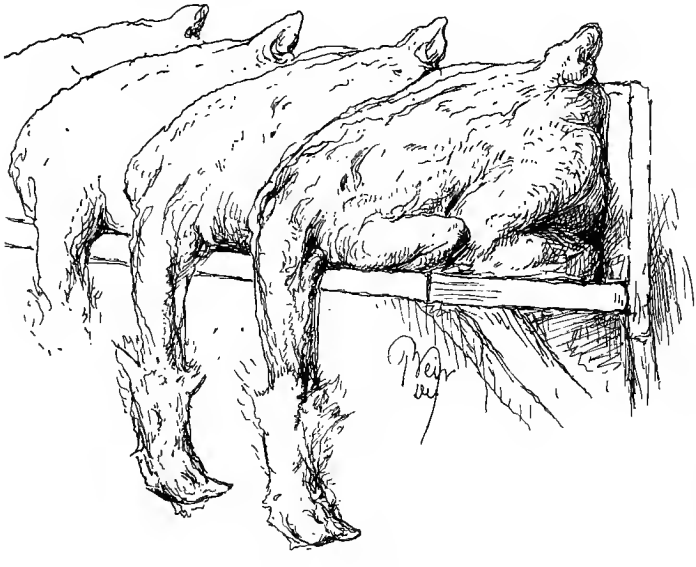
There is nothing new in the process of fattening as now used. It is the same as that used thousands of years ago by the inhabitants of Delos and others who were celebrated for the perfection of their poultry, and as such have a world-time lasting fame.

The poultrymen of to-day claim an excellence and an advance to which they are by no means entitled: the same kind of food is used now as was used centuries ago, and the methods adopted for feeding in England and America are similar to those followed in the eighteenth century, and doubtless long before. Poultry has been one of the most valued adjuncts to the farm from time immemorial, as is clearly proved by the law documents and books of household expenses. The rearing of the stock was one of the duties of the poulterer and the henwife, while the fattening process was generally a business by itself, as presently will be shown.

Coop Fattening

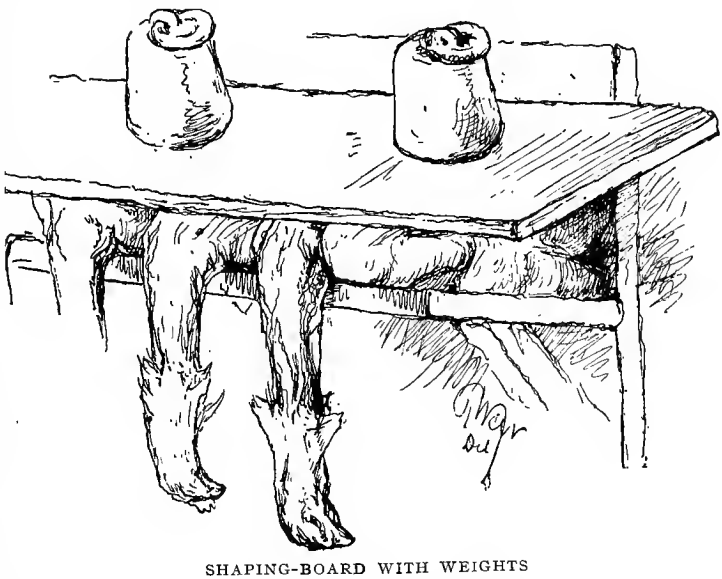
The coop finishing of poultry is practically the same as it was in the time of Columella two thousand years ago, and it is doubtful, judging by the description that he gives, whether we have better table fowls, or even as good, as those that he so graphically describes. Even then, as now, the

rearing and the finishing were two distinct occupations, for he says: "Although it is the business of a poulterer, and not of a husbandman, to fatten a hen, nevertheless, because there is no great difficulty nor charges in the doing it I have thought it proper to give directions concerning it. An exceedingly warm place, and of very little light, is requisite for this purpose, wherein the fowls may be shut up one by one, in very narrow coops or in hanging baskets, but so straightened that they may not be able to turn themselves." This closely resembles the modern French method, and is almost the same as our own, with the exception that we not infrequently put more than one bird in the same compartment. Columella warns the poulterer to beware of lice and other vermin, and to take precautions to prevent the fowls from being infested with such pests, as they materially retard the finishing and are directly opposed to the well-being of the fowl or the progress of the process. He continues: "But they give barley meal for their food, of which, when they have sprinkled with water and kneaded it, they make pellets and fatten the fowls therewith; but these ought to be given more sparingly the first days, till they are accustomed to a greater quantity, for indigestion is especially to be avoided, and as much must be given them as they can digest. . . . They who are desirious not only to make their fowls fat but also tender, sprinkle that kind of meal beforementioned with fresh mead, and so cram them. Some mix one part of good wine with three parts water, and with wheat bread soaked therein fatten the fowl."



SHAPING-BOARD

Then M. Porcius Cato, who died in the year of Rome 604, in his treatise on agriculture says (Owen's Trans., page 102): "Cram hens and geese thus: Confine tender pullets which are likely to lay, make pellets of flour and barley meal, dip them in water, and administer them, adding a little gradually every day, judge of what is sufficient for the pullets' voracity. Cram them twice a day and give them water at noon, and let not the water remain before them more than an hour. Feed geese in the same manner, but give them drink first, and twice a day, and give them food twice." And Marcus Varro, the friend of Cicero, who also wrote a treatise on agriculture, thus observes (Owen's Trans., B. 11, page 228): "In respect to the three sorts, the Vallatic poultry is mostly fattened. They confine them in a warm, narrow and dark place, for motion and light are unfavorable to fattening. They cram them with pellets made of barley meal mixed with the flower of darnel, or linseed, and some spring water, having taken off the large feathers of the wings and tail. They feed them twice a day, observing from certain signs that the first meal may be digested before they give a second. Having given them food, they clean their heads of vermin and shut them up again. They do this during five and twenty days. Some cram them with wheat bread dipt in water mixed with good and well-flavored wine, so that they make them fat and tender in twenty days. If they become fastidious from too much cramming, you must be more remiss in proportion, and after the first ten days you may diminish the quantity in that ratio that the twentieth and the first day may be equal."



SHAPING-BOARD WITH WEIGHTS

We might almost imagine these descriptions were written by one

who had visited and inspected one of the great modern poultry-finishing plants, so similar are the methods described to those in use to-day. In these modern plants the poultry is brought from the farms by hucksters, who go about the country for this purpose. It is then placed in small cages, five or six in each, and fed a mixture of ground grains, the mixture usually containing oats, wheat, corn, barley, and sometimes oil meal. This is mixed with milk or water to the consistency of a thick batter and fed in troughs arranged outside the coops or cages. As soon as the fowls have eaten all they will the troughs are removed and thoroughly cleaned The feeding is done three times a day, and it takes from twenty to twenty-five days to finish a fowl, the time depending on its condition when the process was begun.

The cages are arranged on each side of a long building, in tiers five or six cages high. These cages have a solid bottom and on top of this is a slatted bottom, raised one inch from the true one. This allows the droppings to fall through the openings between the slats, where they lodge, and it is not necessary to clean the cages until the fowls in them are finished. No water is given during this finishing process, as the food is wet enough to supply the needs of the fowls.

The cramming machine is slowly coming into use, and will no doubt soon be in as high repute in this country as it is in France. In these great plants, as soon as the feeding is finished curtains are drawn along each side of the passageway in such a manner as to shut out most of the light, leaving semidarkness, which induces quiet and the more rapid addition of weight. The illustration on page 205 is from a photograph taken by the writer during a visit to one of the greatest finishing plants in the United States. It shows very plainly the manner of arranging the cages in which the fowls are confined. It also shows one of the cramming machines mentioned in this connection, and the old English poultryman who was brought over from Sussex to instruct American attendants into the mysteries of finishing fowls by the English method.

Doubtless in England, during the time of the Roman occupation, the keeping and the fattening of poultry was common, as it was long after in the time of the Saxons and Normans, for mention is made of fattened capons, capons of geese, etc., in some of the early records. And later, Polydore, in the time of the Henrys, mentions the tenderness of the young geese and the Kentish hens, and in the "Antiquities of

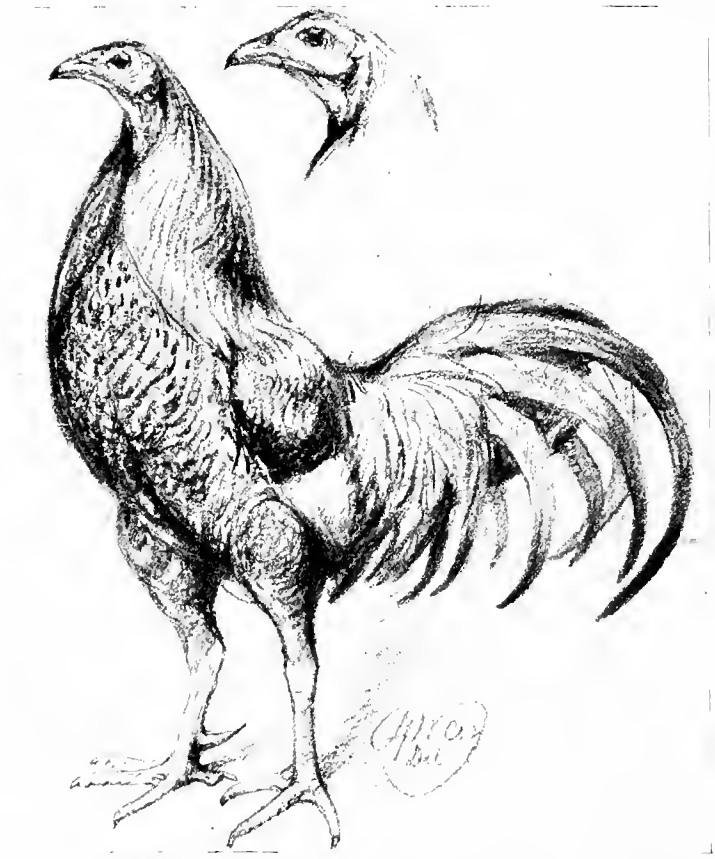
Photograph by Miller Purvis

INTERIOR VIEW OF A POULTRY-FINISHING PLANT, SHOWING METHOD OF CRAMMING

Hengrave, in Suffolk, A.D. 1572," there is this entry: "To my M^res^ as to so much by her given to two maids w^h^ came out of Essex to teach the maides to fatte capons, xiij*s.* xiij*d.*"—a goodly sum in those days. I quote this to show that, more than three centuries ago, in England, not only was good poultry raised, but the finishing process was a separate and desirable art to learn in conjunction with the breeding and rearing.

Leonard Mascall (who wrote A.D. 1570) says that for "the fattening of bigge chickens in the coope or penne, they doe commonlye give them steeped bread in ale, sometimes of dry breade, and their drink, milk and water, or of soaked bran in milke; and sometimes ye must give them barley, and feel them one after another, if there be anything left in their crops, for if that which they have eaten is not gone and consumed, nor their craw yet emptie, that signifieth undigested, and like not the meate, then give them no more until they have digested that." And further Mascall says of pullets: "For the feeding and cramming of young pullets, a verye goode

way is this to make them fatte and tender to eate: ye shall keep them in a darke place, or blindfold them; then take barlye ground small and sift all the branne thereof, then they doe use to moysten this barley meale with warm milke; and some take ale, and some beare, and so they cramme and feed them morning and evening, by giving them as much at once as they may well digest; and to helpe their digestion, some doe mix with their meate of mustarde seede, or anise seedes; thus you may fat them in short space."



MR. MATTHEWS' PRIZE STREAKY-BREASTED BROWN-RED OLD ENGLISH GAME COCKEREL

Gervase Markham, and other writers on the subject, during the sixteenth century, all give more or less similar advice; and in some, stones or something hard is mentioned as helping digestion. In the "Mystery of Husbandry," by J. W. (Worlidge), A.D. 1681, we read: "If convenient places or houses were made for them as dark as may be, which doth much expedite their fattening. Buckwheat, either ground and made into paste, or whole (the former is the better), is the best single fatner of fowl, hemp seeds, as they say, giving an ill flavor to the flesh of the bird that feeds on it; but this only on report; if it proves otherwise, it would be one great

encouragement for the planting and sowing of hemp that the seed should be of great use." In another place we find this advice: "Most certain it is, that darkness doth much conduce to the fat'ning of any creature; also, rest and sleep. Gravel not a little availeth, it being usual, that when poultry are penned up and have lost their appetite, being set where gravel is, they will greedily eat." This practice has always been that of the intelligent poultryman, even to the present, and no birds, whether cooped for finishing, or other purposes confined, were expected to thrive without it, broken shells, or very coarse sand. The modern poultry keeper has also within the last few years made this discovery, and written columns in favor of the practice as being new, though known for centuries.

During the last century the following methods of finishing were in vogue: The first consisted in cooping the poultry in a dark place, in feeding the fowls abundantly with barley, buckwheat, or maize, either of these seeds boiled and made into balls.

The second, practiced in Maris (France), differed in that instead of letting the poultry feed at liberty, they were made to swallow rolls of paste in an oval shape, about two inches in length and one in breadth, made of two parts barley meal, one part buckwheat, and a sufficient quantity of milk.

The third method was accounted more expeditious than the preceding. The fowls, being put into rows of pens and placed in a warm place, were crammed two or three times a day by means of a funnel with the meal of barley, wheat, small millet and maize, soaked in milk. A small quantity of this mixture in a rather liquid state was given them at first, no drink being allowed. The dose was afterward gradually increased until the crop was filled entirely, allowing time enough to empty it in each case before the renewal of the process, in order not to disturb the digestion.

The cages employed in the third method were a series of small pens, in which each fowl was separate, and in a manner cased up and so closely wedged in that it could move with difficulty. All that it was allowed to do was to thrust its head through a hole and void through another. With the help of the funnel a man could cram fifty fowls in half an hour. The machine used was similar to that now in use at many finishing plants. Every time the funnel was used for cramming the whole number it was washed, as any remains of food on it would become sour. The chickens fed in this manner were particularly well suited to poultry dealers.

At the end of a week they were very white and well flavored; in a fortnight they would be at their best.

A writer in "The Family Receipt Book," 1815, gives the following for fattening poultry. I quote it because it indicates the general use of gravel, now called grit, for the healthful feeding of cooped birds: "Poultry should be fattened in coops, and kept clean. They should be furnished with gravel but no water; their only food, barley meal, mixed so thin with water as to serve them for drink. Their thirst makes them eat more than they otherwise would, in order to extract the water that is in the food. This should

From a drawing by Harrison Weir

RED PILE

not be put in troughs, but laid on a board, which should be washed clean before fresh food is put upon it." Another method for fattening at this period was one then much in vogue, as it was supposed to add a finer flavor than that in ordinary use: "Take, for the purpose, a quantity of rice and grind or pound it into fine flour. Mix sufficient for present use with milk and a little coarse sugar; stir the whole well over the fire, till it makes a thick paste, and feed the chickens, in the daytime only, putting as much as they can eat, and no more, into the troughs belonging to the coops. It must be eaten while warm, and if they have also beer to drink they will soon grow very fat. A mixture of oatmeal and treacle, combined till it crumbles, is said to form a good food for chickens, of which they are fond and on which they thrive so rapidly that at the end of two months they become as large as the average full-grown fowls fed in the common way."

"About the early part of the nineteenth century, Mr. Turner, of North Chapel, in Sussex, a tenant of Lord Egremont's, was wont to fatten about two hundred chickens annually to a size and prefection not known elsewhere. The food given them was ground oats, made into gruel, mixed with hog's lard or grease, sugar, pot liquor, and milk; or ground oats, treacle, and suet, also sheep's pluck, etc. They were kept very warm, and always crammed in the morning and at night. The pot liquor was mixed with a few handfuls of oatmeal, then boiled up, taken off the fire, and the meal therewith made into paste and divided into rolls for cramming. The fowls were put into the coops a few days previous to cramming, the process being completed in a fortnight. Fowls thus fattened would weigh about seven pounds, and average five pounds, though some arrived at double that weight."—*Sussex Agricultural Report.*

The system of cramming became usual with the hucksters both in Kent and Sussex, and fowls of large size and weight were not infrequently produced. My father had a couple of pullets from a farmer of Cuckfield, Christmas, 1834, which weighed one ounce more than twenty-one pounds, the food used in this instance being two parts oatmeal to one part of barley meal mixed with milk, with some suet and a little sugar added. Some of the old Kent and Sussex capons, fully fattened, have weighed at Christmas as much as twelve to thirteen pounds. Latterly the sugar, treacle or molasses mixture has been abandoned in favor of oatmeal and barley meal mixed with boiled skim milk.

Formerly, as at present, the best fattened and finest table fowls in Eng-

land were to be found either in Kent, Sussex, Surrey or Bucks, and it was from these counties that London and other large cities or towns obtained their chief supply. In no other counties was so much care exercised in the selection of the breeding stock or the management and rearing of chickens. These were collected by hucksters, some going on foot, with nets or coops at their backs, which would contain one dozen to two dozen chickens, according to size. These men often traveled twenty miles a day, while others with a horse and panniers or cart would far exceed this distance.

The fowls now chiefly kept in England are the following: The Brahma-Dorking cross—a rough-and-ready kind, also a long-cherished buff cross with the Shanghai, both large-boned by comparison with older and better breeds. The Langshan has been found to be very good, but in some instances it does not thrive well in the fattening pens.

One English poultry dealer who finishes a large number of fowls every year and is very successful uses the following method: The chickens are taken in tops or crates to the finishing sheds or yards and at once placed in the pens. If not "fasted" they are kept without food for a few hours to increase their appetites, to reconcile them to feeding in coops. The cages are in long lines, about breast high, and are lightly constructed, having the backs, fronts and bottoms made of wooden bars, the roof and sides of close wood or corrugated iron. Each compartment will hold four fowls, with just room to turn around. In some cases a flat board is in front, on which the food is placed. In others a V-shaped trough, or parts of zinc water-chuting, are used. The cages are sometimes covered with canvas drawn down in front, as darkness is said to shorten the time required for the process. Usually the pens are placed in sheds or barns, which are kept close and dark. Warmth being essential, ventilation in some cases is neglected except in summer. The droppings fall through the bottom bars of the pen on fresh earth, which is removed and renewed periodically. Cleanliness of the pens, and frequent washing with lime-water in which carbolic acid is mixed, is considered to be essentials to success.

The period of finishing varies slightly, some responding to the process and the kind of food used better than others, but it is seldom less than from three to four weeks. The chickens are fed twice a day on ground oats (not oatmeal) mixed with skim milk, enriched with fat either of beef or mutton. This dealer feeds quantities of Australian mutton tallow, which is imported

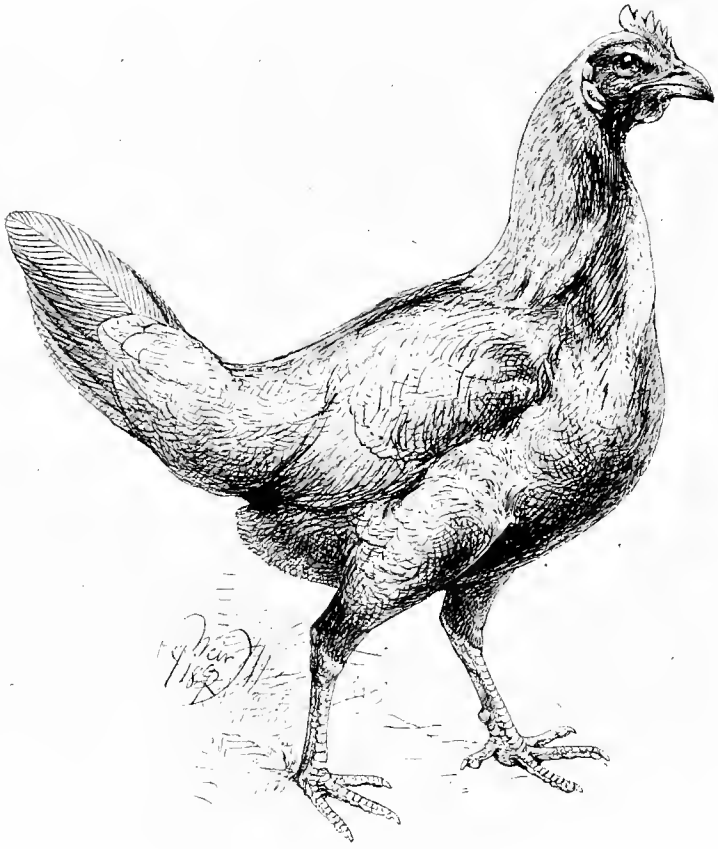
in barrels, and is mainly used for soap-making; the cost is $7.50 to $10 per 100 pounds. The fat is melted and mixed with the ground oats and milk, to which some brick-dust or sand is added as a digester. For the first two weeks the chickens eat naturally, but afterward they are crammed until finished. The operation is performed rapidly by a cramming machine, which now supersedes the old hand process. If the operator is experienced the cramming is very quickly done, the tube of the machine being inserted into the fowl's mouth, a half turn of the crank, and then it is — next, and — next. The price of the machine varies from $17.50 to $22.50. It is usual to kill twice or three times a week, according to the demand, but when ready they sicken if not attended to. The plucking and stubbing is mostly done by women, after which they are put in rows breast downward on a shaping-board and a weight placed over them.

PROPERLY FINISHED PLYMOUTH ROCK HEN

Photograph by courtesy of Miller Purvis

One curious fact remains to be noted, namely, that the demand for chickens is far greater than the supply, and there are several finishers who are so far short of their needs in this respect as to advertise for at least one hundred dozens per week during the season.

There is much difference in the capacity of fowls for finishing, those that are somewhat long in feather taking on fat more readily than the close, short-feathered breeds. Here I would point out that fowls fatten generally, if not always, on those parts on which the plumage grows. Thus on the back, where the feathers are close, the fat is excessive, as also about the neck and belly; while on the breast, where there are open spaces between the lines or tracts of the feathering, there is no fat. The goose might be taken as an example of the difference between a feather-covered bird and one that is partially so, the whole body of the former being enveloped in layers of fat, while those fowls that are short- and close-feathered on



OLD ENGLISH GAME HEN

the breast seldom if ever fatten on that part, though they may be fleshy and well formed.

It has generally been supposed that the more nutritious the food given the better the fowl, but experiments have proved that this is by no means always the case. For instance, buckwheat and oatmeal mixed have not been found so serviceable as when one-third of boiled potatoes have been added. Again, ground corn is better with one-third boiled unhusked rice. Ground oats, with one part potatoes or some boiled cabbage,

are good; wheat and rice boiled together are good, as is also buckwheat and one-third potatoes, with a finish of all buckwheat. The old finishers never gave hard grain, but, if whole, soaked it at least twelve hours, or boiled it. In all cases it was usual to add some gravel or very sharp sand. Sometimes table beer was used in the latter part of the day for moistening the food, and skim milk in the morning, but not generally. The giving of sugar was thought to make the birds so thirsty that they would eat more of the mixed food for the sake of moisture.

Preparing for Use or Market

The English method is as follows: A fowl should be fasted from twelve to twenty hours before it is killed, otherwise it soon taints. When a fowl is ready, or sufficiently fat for the purpose required, the usual plan of killing is that of breaking the neck, which by an adept is quickly and painlessly effected. Another method is bleeding, which is more common in France than in this country. With some the fowl is stunned by a blow at the base of the skull, if bled; but the first plan is the most humane. Immediately after, the process of plucking is performed, when great care must be taken not to tear or injure the skin, this being likely through rough usage, especially on the breast, which is generally first operated on. Then the feathers on the back, belly, lesser wing coverts and tail are removed, leaving the head feathers, those of the upper part of the neck, and the larger wing primaries or quills. After which pluck away all feathers but those of the head and neck. So quick are some of the American pluckers that they have been known to remove the feathers of six fowls in twelve minutes, while many of the English experts are not a minute behind, showing that practice makes perfect. The birds are hung up to slightly cool, then taken down, and their legs tied at the hocks; they are placed in rows, with the breast under, on shaping boards, another board then laid on, with weights added. They cool into shape. When cool they are removed, packed into crates, and despatched to market. Pullets, cockerels and capons keep better than quite young chickens or ducklings.

We have purposely given in considerable detail the English and French methods of finishing fowls, and also the methods advised by ancient writers, because the essential facts have been understood for hundreds of years, and the finishing of fowls is practically accomplished by the same means to-

day that were in vogue during the time of the Roman Empire. In this country we use more corn than in other countries because it is the cheapest grain food we have and is essentially a fattening food.

The American method of preparing for market is somewhat different from that in use in England. In our large finishing plants the fowls are not fed for twenty-four hours previously to being dressed. They are placed in crates and taken to the dressing-rooms, where an attendant catches them and hangs them by the feet in a device that holds them fast. This device is suspended on a wire, a small wheel running on the wire. The fowls, hanging head down, are then pushed forward and another workman kills them by deftly cutting the artery in the back of the head with a pointed knife. As they are pushed along on the wire support in a continual procession they come to a tank of scalding water, where they are taken from the support, scalded, and quickly returned. Then a workman makes a quick "grab" and pulls out a handful of feathers, and, with the same motion, pushes the bird forward, where another takes out another handful, and so on, each workman pulling out as many feathers as he can without stopping the bird in its onward course. By this means the feathers are stripped off in an incredibly short time, and a line of birds extends the whole length of the long wire, all progressing toward complete dressing all the time.

Where it is desired to save the wing and tail feathers without wetting them, these are pulled out before the bird is scalded and kept separate from the softer feathers.

As soon as the feathers are all stripped from a fowl, it is taken from the wire and laid on a shelf on a rack specially constructed for this purpose, where it is allowed to cool until all the animal heat is out of the body. The birds then go to the inspector, who rapidly grades them, and they are packed in new, clean boxes and pressed into shape and taken to the freezing-rooms, where they remain until taken out to be sent in refrigerator cars to market, often across the ocean.

The inspector selects the birds according to quality, those with very short thighs being put by themselves and reserved for the English market, being sold under the name of "Sussex fowls," the reputation of Sussex in England being so great that the best are given the name in order to get a better price for them, just as all good butter is sold as Elgin butter.

English finishers seem to think cross-bred fowls better than the pure breeds, but the great poultry dealers in this country do not agree with

them; and one firm that handles millions of fowls every year has been at considerable expense to teach the poultry breeders of the districts from which they draw their supplies the advantages of using only pure-bred stock in their breeding pens.

The English consumer is partial to a fowl with a white skin, while the American wants yellow-skinned fowls. This is mere fancy, and it is probable that before many years the prejudice that exists in this country against white-skinned fowls will disappear. The great poultry-packing firms of the country do not finish fowls particularly because they desire to

OLD ENGLISH GAME, AGRICULTURAL HALL, 1897

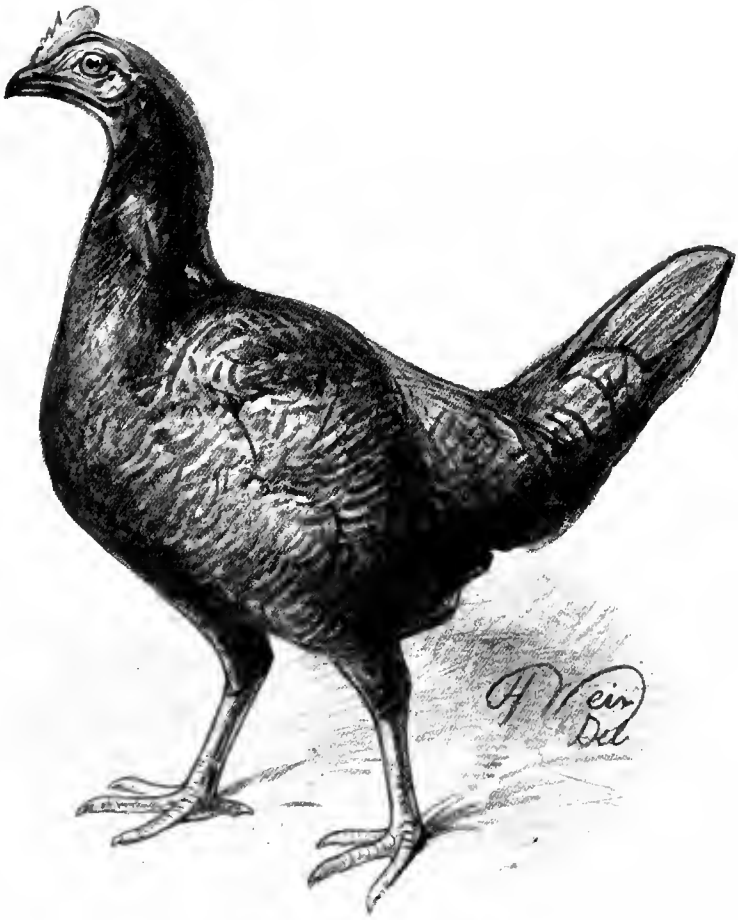
do so, but because they are compelled to do so in order to get the quality the best markets demand.

The most profitable part of poultry breeding is in this final operation that finishes the fowl and puts it in condition to command the highest price.

The writer has seen a lot of ordinary fowls which were bought at six or seven cents per pound put in the finishing pens for three weeks and taken out weighing twenty or twenty-four ounces more than they did when put in, and worth more than twice as much per pound as they were when bought on the farm of the breeder who produced them. In such cases the finishing process not only added weight to the fowls, but added one hundred per cent. or more to the value of the weight they carried before the process was begun.

The market for the best poultry is an insistent and growing one. It

has never yet been supplied with all it would take. Any glut in the market is always produced by an oversupply of inferior stuff, which does not meet with a ready sale. Any poultry breeder, by following the directions given in this chapter, modifying them to meet his surroundings, may with very little trouble be able to meet the demand that will rapidly grow for properly finished poultry. Every city and every considerable town in this country would consume large quantities of poultry that had been finished properly, if it were once introduced, for its superiority to poultry as ordinarily fattened is so great that it commends itself at once to every one having an opportunity to compare the two qualities.



DARK-BLUE OLD ENGLISH GAME HEN
Aquarium Fishery Show, 1902

CONDITIONS IN THE UNITED STATES

H. E. Moss, New York

THE fattening or finishing of poultry by any special process or feed with this definite object in view is practically a new and almost unknown industry in the United States. Until two years ago, when the writer made and exhibited a cramming machine at several of our large poultry shows, not one person in a thousand had ever heard of such a thing, and many who saw it in operation protested that we should be prohibited from using it under the plea that it was cruelty to animals, due of course to their lack of knowledge of the anatomy of the bird.

It is scarcely ten years since the large packing-houses at Chicago and Kansas City took up the poultry and egg question, which has since grown to be such an important branch of their business of supplying the world with meat food. Several years later the writer urged upon them the advisability and importance of either the producer or a middleman putting a finish on thin birds, there being a very large percentage that dressed out as No. 2 stock which had either to be worked into soup or canned, or sold at a reduced price, and even at a loss. There was surely an extravagant waste of opportunity on the part of some one. Here were three-pound chickens with their frames practically grown—carcasses that carried about six ounces of bone, eighteen of fat and but thirteen ounces, or twenty-eight per cent., of edible meat, when such a bird of almost any suitable breed could, by twenty to twenty-five days of proper feeding, be made to carry forty ounces, or three times as much weight, of edible meat. The packers realized these facts, and spent both time and money in what proved a futile attempt to impress upon the farmer the importance of special feeding and better breeds, so as buyers of their stock they might be able to secure more birds of the quality for which they had an almost unlimited demand, and fewer of the unprofitable kind. They recently took the matter in their own hands and to-day there is scarcely a town of any size in the States west of and tributary to Chicago and Kansas City in

which there is not located a buying station for one of the packers, where birds are taken from the farmer. At many stations they are coop-fed and finished before being dressed and sent to the central house for final grading, packing and shipping.

It is difficult to understand why the farmer, who has every facility for properly finishing his fowls, should waste this opportunity. He is very careful to see that every steer, hog or sheep that he sends to the shambles is carrying all the weight possible—but he thinks it costs him nothing to produce his poultry and all that he gets for it is clear profit; whereas, if properly handled, a pound of grain can be converted into more poultry meat, of greater value and in less time, than through the four-footed animals.

The packers are not the only ones who have discovered this possibility. Since 1900 many individuals and companies have gone into the finishing business in the western States, while a few had previously been established. Very little is known of the magnitude or methods of their business. Their No. 1 stock is almost all exported, and little is known of it in the eastern markets. The *New York Produce Review* of February, 1903, reports one shipment of seventeen carloads as having left New York for Liverpool on the steamship *Celtic*.

These finishers have encountered but one obstacle, and that is the unintentional production of a variable and uncertain quality of meat, and an excess of fat in layers. This is the result of the random and experimental methods of feeding they have followed. But within two years they have made much advancement in producing birds of the color and finish that foreign markets demand, which it is necessary to furnish if they would obtain the prices they are seeking. The farmer sticks to corn, which, perhaps above all other cereals, makes the most unsatisfactory quality of meat; but as it produces weight and is the cheapest and most available grain, he supplies it, and where the supply is unstinted the weight is gained. The peculiar nutritive properties of corn and its effects are comparatively unknown to the average feeder. It has a special tendency to deposit a soft, oily fat in layers under the skin and in masses in the abdominal cavity, instead of depositing this fat in globules throughout the tissue where it belongs. In corn-fed birds these globules are watery instead of being fat. When such a bird is cooked these oil globules escape and the carcass shrinks. If oats, barley or a suitable mixture of these and other grains, ground,

BLACK-BREASTED PRIMROSE DUCKWING OLD ENGLISH GAME COCKEREL
Owned and bred by Mr. Weir

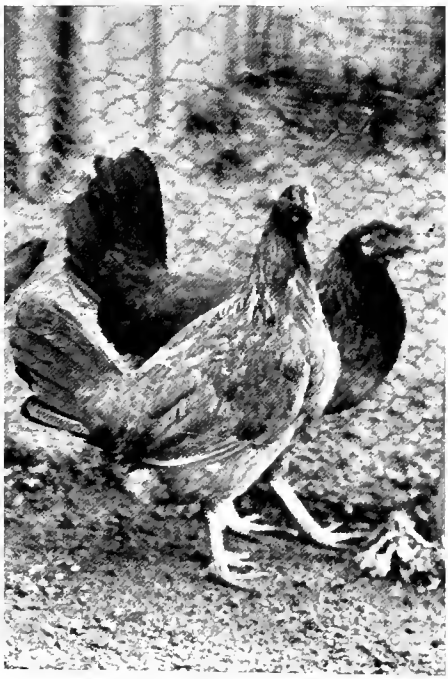
were used as a base in feeding, these globules would consist of fat which would soften in cooking, thereby rendering the tissues soft and juicy.

Numerous experiments in fattening have been made in the eastern and New England States in the past, but the demands of the eastern markets always having been for a yellow-skinned, plump bird, there appeared but one course open to poultry fatteners, and to secure it corn was used *ad libitum*. As a result, where a forced diet of corn was fed—often without the safeguards necessary to accompany it—indigestion and liver or bowel trouble followed and defeated their purposes, which discouraged them to such an extent that but little general advancement was made along this line.

The western men have outstripped those of the East, and it is a common occurrence to find 25,000 birds in the coops of one establishment at one time during the fattening season. These are ordinary farm birds,

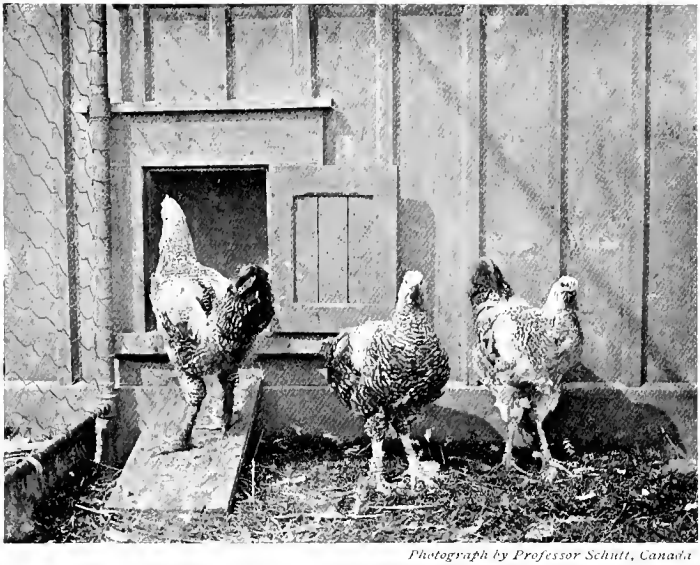
the American breeds predominating, and largely Plymouth Rocks or their crosses.

The fattening industry is in its infancy in this country. It has no past. As yet we have nothing here with which to make a comparison, but we are safe in predicting its rapid growth. Many cramming machines are now in use, and many people are seriously investigating and studying the possibilities of both trough and machine fattening. To these we wish to say there is much to be learned before the maximum results can be attained, as Mr. Purvis and Mr. Weir have clearly shown in this chapter: The questions of how much, what kind, and when to feed it are the vital ones. Experience will teach as no other method can. The question of best breeds for the purpose will also determine itself in time. The writer believes the Dorking-Brahma cross would prove superior to any for the purpose, but it would take many years to establish this or any other special cross to the exclusion of others, even if a united effort were made in the large poultry producing sections.



Photographed by C. Reid, Wishaw, N. B.

OLD ENGLISH GAME HENS



Photograph by Professor Schutt, Canada

MARKET TYPES OF LIGHT BRAHMA AND BARRED PLYMOUTH ROCK CROSS COCKERELS AS BRED AT THE CENTRAL EXPERIMENTAL FARMS IN CANADA

THE SITUATION IN CANADA

PROFESSOR A. G. GILBERT, ONTARIO

THE rapid growth of cities, with corresponding development of population and augmentation of wealth, has created a great demand for the products of the farm for consumption both at home and abroad. In this connection we have an urgent and ever-increasing call for a superior quality of poultry and eggs of undoubted freshness in winter, the latter especially from our own city markets. Opportunities are thus afforded our farmers to make money out of their fowls both summer and winter. It is of the superior quality of poultry and how to produce it that we more particularly write on this occasion. There are undoubtedly other producers of the finer quality of poultry than farmers, but we speak of the latter because from them must inevitably come the great bulk of the supply. This supply will not be from the few farmers with many fowls, but rather from the greater number with comparatively few hens each. It is of very great importance, then, that our farmers should thoroughly understand the necessity of producing nothing but the best. How can that superior quality be produced?

Experience has unmistakably shown that breed, feed and proper caring

for the chicken after hatching and during its tender months are all factors of vital importance.

The finishing of the chicken in reality begins at an early period of its existence. It has been shown over and over again that unless the chicken has been regularly fed and carefully looked after from the time of leaving the nest or incubator it will not make a satisfactory subject for fleshing in coop or pen with limited run. There is a world of truth in the old English maxim that a chick which has become "stunted" from being "stinted" of food will never fully recover from such neglect. If the "feed" is not altogether half the "breed," it certainly has a potent effect. And again, a bird may be properly reared and carefully finished and yet its market value much deteriorated by improper killing, careless plucking or clumsy dressing. The first six weeks of the chicken's life has been found to be a critical period, demanding extra care and attention, for during that time there is a tax on its vitality for bone, sinew, muscle and rapidly growing feathers.

Before proceeding to note the merits of different breeds it is well to understand the requirements of the market to be catered to. We have two markets, with their different features, as follows:

The home market, with a high price for winter eggs and for young and tender birds with yellow color of flesh and legs.

The British market, which gives the best price for birds three and four months of age, with legs of light color and flesh as white as possible, and eggs large and of even size, preferably weighing seven to a pound.

It is now in order to consider which breeds most acceptably fill the requirements of the aforementioned markets. Heretofore there has been little difficulty in supplying the demand with one or more of the well-known American utility breeds. In this sense the term utility is used to describe a breed which is a winter layer as well as a rapid flesh-maker in spring or early summer, thus permitting the farmer to make money at both seasons. In too many cases, either from carelessness, bad management or ignorance of proper methods, farmers have fowls of nondescript origin which are non-productive during the winter season of high values. They begin to lay in spring and summer, when prices are very much reduced. It is needless to point out that in such cases only half value is obtained. Where up-to-date methods are practiced, the fowls are gotten over their molt by early fall; are in proper condition, being neither too fat nor too lean; and so comfortably housed and intelligently fed that they begin to yield their

Photograph by Professor Schutt, Canada

WHITE WYANDOTTE COCKERELS AS FINISHED IN CANADA FOR MARKET AT THE CENTRAL EXPERIMENTAL FARMS

Hatched March 31, 1902, and killed when 3 months and 22 days old. No. 17: Live weight, 5 lbs. 3 ozs.; plucked but not drawn, 4 lbs. 14½ ozs. No. 22: Live weight, 4 lbs. 7 ozs.; plucked but not drawn, 4 lbs. 2½ ozs.

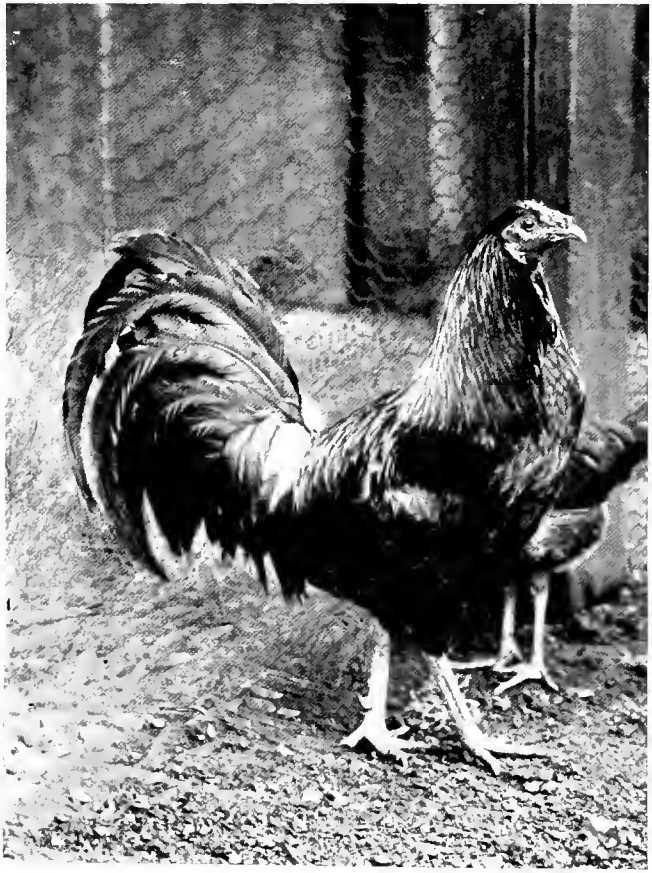
product in November and continue so to do all winter. In April the eggs, which are then cheap, are converted into chickens, which will mature early and bring a good price. We do not refer to specialists, who begin operations in December or January with the aim of producing early broilers. These operators are in most cases skilled men and have special equipment, such as incubator rooms, brooding houses, etc.

In the colder districts of the country, unless the farmers are provided with facilities to enable them to be independent of outside temperatures, they will find the most satisfactory chickens to be those hatched in late April or early May. The importance of having a grass run at this season for the chicks, whether hen or incubator hatched, can not be overestimated.

As to the means of hatching, where more than fifty or sixty chickens are desired early and of uniform age, artificial incubation will be found most satisfactory.

Quite possibly it may be pointed out that germs of April eggs from

hens which have been closely confined during the previous winter, yet good layers, are not likely to be strong. In certain cases this is doubtless true, but observation has shown that the majority of farmers have opportunity to allow their fowls to run in barn or shed during winter and so enjoy exercise and fresh air, so conducive to fertile eggs and strong germs. Where laying hens have been so situated, results in healthy chicks from early eggs have been most satisfactory. In the case of the closely confined hens without opportunity for outdoor exercise, experience has shown it is better to defer hatching operations until they have had a run outside and time to recuperate from their enforced term of artificial life and treatment.



Photograph by C. Reid, Wishaw, N. B.

OLD ENGLISH GAME COCK

Photograph by courtesy of New York State Experiment Station

YARD OF CAPONS AT THE NEW YORK STATE EXPERIMENT STATION AT GENEVA

CAPONS AND CAPONIZING *

A CAPON bears the same relation to a cockerel that a steer does to a bull; it is an altered rooster. As with steers, a Capon is more quiet, lays on much flesh and fat, and remains tender for many months after the operation. They usually weigh from twenty to thirty per cent. more than roosters of the same age, if kept the proper length of time. For a few months after caponizing they are very hearty eaters, but later do not consume appreciably more food than ordinary fowls. The comb and wattles do not grow after the operation, while the feathers of the neck and saddle develop rapidly, becoming very glossy. They neither crow nor fight, and do not chase the hens. In many eastern markets the prices paid for them range from eighteen to thirty cents per pound.

Caponizing was in existence more than two thousand years ago. It was the impression that such fowls fatted better, and were of finer flavor and quality. At first hens only were fed, but Pliny says fatting cocks

*This chapter has been carefully rewritten by the editor from an American point of view. In Canada, Capons have not been given as much attention, up to the present time, as in the United States.

was begun by the inhabitants of Delos. Beckmann states that "These people brought the art to such perfection that they became instructors to the Romans, among whom all those who made a trade of feeding fowls were called *deliaci*." It was in practice also with the ancient Athenians, for it is recorded that Arcesidans, the son of Scuthus, on being asked "why many scolers of everye secte became epicures, but none of the epicures became of other sects," he said, "because the cockes were made of men, but never men of cockes," or as some say, "Capons be made of cocks, but never cocks of Capons."

In course of time the Romans followed the example of the Greeks, who had long known that the feeding of cocks could be much improved by rendering these animals incapable of propagating their species. As the Delians took advantage of this process, and acquired the greatest dexterity in the management of it, they are mentioned by the ancient writers. The invention of this art is not known. It is, however, singular that the Greek writers mention no particular name for Capon. It is not known whence the Romans obtained the terms "capo" and "capus."

Columella and Galen make mention of such birds, and fed on food prepared with milk, though the practice of caponizing was dissimilar to that now employed.

"How old our present method of making Capons may be," says Beckmann, "I do not know, but one might almost believe that it was practised in the seventh century, because Isidore of Seville seems to say so, unless we are to suppose this ecclesiastic, not being fully master of the subject, wrote merely from conjecture.

"The present mode was no doubt," continues the same author, "first practised in France, at the beginning of the sixteenth century, but it was not made known in Germany till a much later period, when the princes began to fall into the weakness of imitating the French by employing French cooks. La Bruyere-Champier, who wrote his book on 'Cookery,' in 1530, says expressly that the art was a new invention. Aldrovandi, in the year 1598, treats of Capons, and adds these were not common. Olivier de Serres, however, in his treatise on 'Agriculture,' A.D. 1600, speaks of this method of feeding being well understood in his day. After that time the word *poularde* was not used as before to denote a cock which had been fed, but one caponized and afterward fed."

Mr. Weir says: "Surely Mr. Beckmann must be a little wrong here,

the word *poularde* usually signifying a pullet so treated, but perhaps it might also mean a caponized cockerel." About 1642 Vincent Tanara, an Italian, stated that Capons were then common. In 1645 Lewis Nonnius said that the method was used to make young cocks more beautiful, and had but lately been known.

Thus it appears that the Germans were much behind in adopting the method. Old writers mention that it was usual in France. There is little doubt that the usage was carried from that country to Germany. Though this might possibly be so, there is no doubt whatever that caponizing was known and used in England long before. Professor Thorold Rogers, in his "Agricultural Price List," gives that of the capon as 2½ d. in 1261-70; 1¾d. in 1271-80, and so continuously almost every ten years until 1391-1400, when it had risen to 3½ d. After this there is frequent mention of it at feasts and banquets, and so without intermission, more or less, to the present time. In "Medieval Agriculture," Vol. I., it states that "Fowls are kept on all estates; Capons on most—before 1348." Tusser, in the seventeenth century, in his "Five Hundred Points of Good Husbandry," says in his cautioning way—

"Who many do feed,
Save much they had need,"

and—

"Put chippings in dippings, use parings to save,
Fat Capons or chickens, that lookest to have,"

and again—

"Leave Capon unmeet,
Dear fed is unsweet,"

which evidently means that it is not to be done with costly grain or food, for he further says—

"Though fat fed is dainty, yet this I thee warn,
Be cunning in fatting, for robbing thy barn."

Shakespeare later mentions Capons in his plays no fewer than a dozen times, and often in eulogistic terms, as—

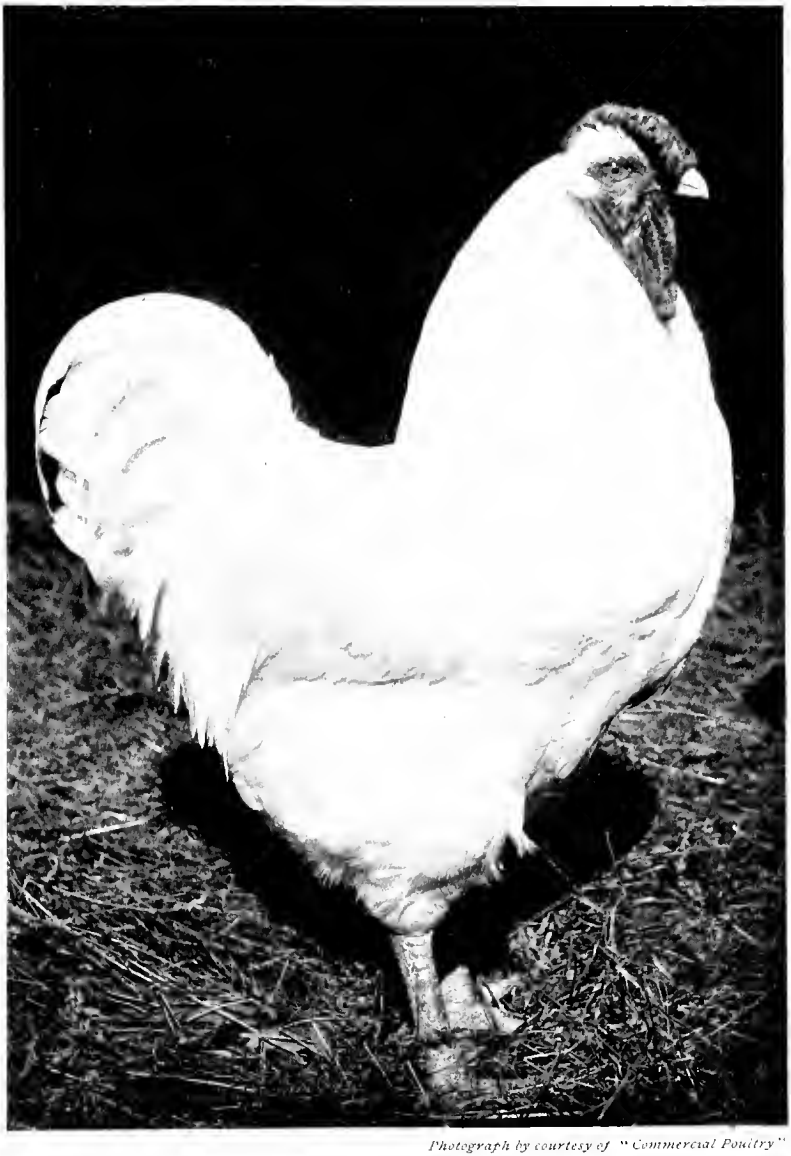
"With good Capon lined."—*As You Like It.*
"But to Carve a Capon and eat it."—*1 Henry IV.*
"You Cannot feed Capons so."—*Hamlet.*

Andrewe Borde, writing A.D. 1542, says: "Of all tame fowle a Capon is the most beste, for it is nutrytyve and is soone dygested. A henne in wynter is good and nutrytyve, and so is a chickyn in somer, specyalle cockrellys and polettes."

Lawrence Andrewe, writing in the sixteenth century in "Noble Lyfe," says of the Capon: "Gallinacius, the Capon, is a gelded cock, and because that he waxeth the soner fatte, and though he go with the hennes, he dothe not defend, nor crowith not."

Leonard Mascall, also about the same period, not only alludes to the Capon, but gives particular instructions as to the best means to be adopted for the fatting: "When as you take uppe your Capons to make them fatte, ye must prepare of wheaten meale, or barlye meale, mixed with two parts of brawne. Then ye shall heate ale or beare, but ale is better, or lukewarm worte, and therewith temper your meale and brawne; some do put thereto fresh hog's grease, or of sheepe, or oil of olive, and when it is all tempered together, they take a small piece and make and roll it betwixt their hands, of two inches long or more, and small at both ends like this figure ⊂, then they dippe it in milke, ale, or oyle, and give a Capon so many thereof as ye shall think good, to a great Capon xx roles, and to the other as ye shall see cause; thus ye muste feede them twice a daye, at morning and evening, and so ye shall make them fatte in a month or lesse, but always ye must see their meate digested before ye give them any more, for some be of a slow digestion, and if ye give them meate upon meate they will loathe it."

In the beginning of the seventeenth century Gervase Markham, in his "Cheape and Good Husbandry," says: "Now, touching Capons, the best time to carve or geld him is as soon as the dam hath left them or they begin to crow, for the act of carving itself is both easie and common, and much sooner learned by seeing one carved than by any demonstration in writing." He also, like Mascall, gives the most approved method of fatting, thus: "To feed capons for the dish, as either at the barn door, with scraps of corn and the shavings of pulse, or else in pens in the house by cramming them, which is the most dainty; the best way to cram a Capon (setting all strange inventures apart)"—from this one would suppose that even at that period there were certain machines or appliances in use, or why are such alluded to? But to resume—"is to take barley-meal reasonably sifted, and, mixing it with new milk, make it into good stiff dough; then make it into long crams, biggest in the midst and small at both ends, and then wetting them in lukewarm milk, give the Capon a full gorge of them three times a day, morning, noon, and night, and he will in a fortnight or three weeks be as fat as any man need to eat."



Photograph by courtesy of "Commercial Poultry"

WHITE WYANDOTTE COCK

Owned by Biltmore Farms, North Carolina

This, though somewhat the same as Mascall's, differs so far as to render it desirable of notice as one of the various means employed for coop-fatting at a later time.

Other authors particularize the "capon"; poets and historians allude to it; culinary books, old and new, have recipes for the cooking; at Christmas Capons found a place on the tables of the wealthy; the landlord had Capons as toll, the tenants dined off their own, while even the cottager at such festive seasons and times of high glee had a tasteful knowledge of what was best in poultry.

According to the "Sandwich (Kent) Records, 1552," Capons were not neglected as propitiatory gifts, for there is an entry to the following effect: "The Lord Warden being late come to Dover Castle, 6 couple (of) Capons be sent him as a pst. (present) at the expense of the town."

Mr. Weir says: "At present Capons in England are not in the ascendant, the big and coarse being the satisfying chick of the people; tenderness and fine flesh, with delicate flavor, is unsought, and quality is not the consideration so much as size, with its concomitant evils of hardness, greasiness, and thick skin. The man who tastes, knows, cares for and appreciates what he is eating—the keen old epicure—is a thing of the past; and it is only on the Continent and in America that the Capon is gastronomically understood and valued. In Paris the finest of the "Créves" and "La Flèche" realize as much as from twenty to twenty-five francs each, while from three to five dollars is not an uncommon price in New York. The French Capon, when really good, is in its way the perfection of poultry. It is generally exposed at the poulterer's lying on the breast, showing the back, which is mostly evenly coated with white, somewhat dense-looking fat. In France, and now in America, caponizing is very prevalent.

"Our French neighbors make use of the Capons to rear and brood chickens. In this they are very successful, one Capon often leading as many as from fifteen to twenty little chicks. After the process of caponizing, the comb is cut off, so as to readily distinguish the birds from the cockerels, and these, if of sufficient size, are 'bottled,' and not only preserved for home use, but exported to England in some quantity. For this purpose the rose comb is not desirable. The variety of forms and sizes, spiked or simply serrated, clearly disposes of any argument that the generality of French fowls are any particular or uniform breed.

"The Capon has sometimes been made to incubate two sittings of eggs

in succession; the first brood, being removed, are often reared to a certain size, fatted, and sold as chicks—*petits a la gourmet.* This plan is much in vogue in Belgium, in which place the dainty morsels are principally of the Coucou de Malines breed. A number of such were exhibited at the Smithfield Show of 1898. They attracted considerable attention both by their novelty and even quality. I was assured by a Belgian poulterer that this practice was not so much done for the purpose of 'marketing' small delicacies, as more often for the want of space after second broods were hatched, though he was of opinion that it was as lucrative as those of a larger growth and more matured, the lesser being sought for by invalids.

"The Capon in the poultry yard has a sorry time: the cocks and cockerels attack him; hens also ill-treat or despise the 'combless' object. Therefore it is advisable to keep Capons apart from the general flock.

"It is not uncommon for a Capon to bring up chickens, but for a Game-cock to do so is indeed rare. M. Cliqueunois, of Lille, had an Australian Game-cock, which was placed with four hens on a walk in the suburbs of that place; the hens all began to sit at the same time, leaving the cock by himself. There was one nest unoccupied, in which had been left several artificial eggs. The cock took possession of that nest; he sat and clucked for a week or so before attention was paid to him; from his persistency it was thought he would incubate. Good eggs were placed under him, when he continued sitting, and, after three weeks, four chickens were hatched. The Editor of the American *Game Cock Monthly*, January, 1895, says: 'We saw the sitting cock last June, when he was right in the midst of his maternal duties; he clucked and acted just like any hen, in spite of the fact that he had gone through many hard battles in his lifetime. Such proves that he was not only a cock, but a Game-cock.' "

Speaking of caponizing, Michael K. Boyer, of New Jersey, says: "Just when the art was introduced in America I cannot say. I have newspaper clippings referring to caponizing that were published about fifty years ago, which shows that at that time the art was more or less practised. Geo. P Pilling, of Philadelphia, a noted expert, says he has had more than forty-nine years' experience in the manufacture of caponizing instruments. 'Philadelphia Capons' are known throughout the United States and Canada. These birds come mostly from New Jersey and other nearby States. Pilling says Philadelphia and vicinity was the pioneer section for raising Capons. As the fame of the bird spread, it naturally took on

the name of its marketing center. In 1888, W. H. Rudd, of Massachusetts, wrote that about 5,000 Capons were sold in Boston annually, mostly during January, February and March. Generally the supply was exhausted by April 10th. The average price was about twenty-two cents per pound, but if very nice and large they brought two cents per pound more. They would weigh about eighteen pounds or upward per pair. The Plymouth Rock, Light Brahmas and Partridge Cochins were generally used. In 1892, Capons in the Philadelphia market sold for twenty-five cents per pound, while roosters brought only six cents per pound. The usual price charged for caponizing by experts was from four to six cents per bird. Capons come into market about the time early broilers are shipped."

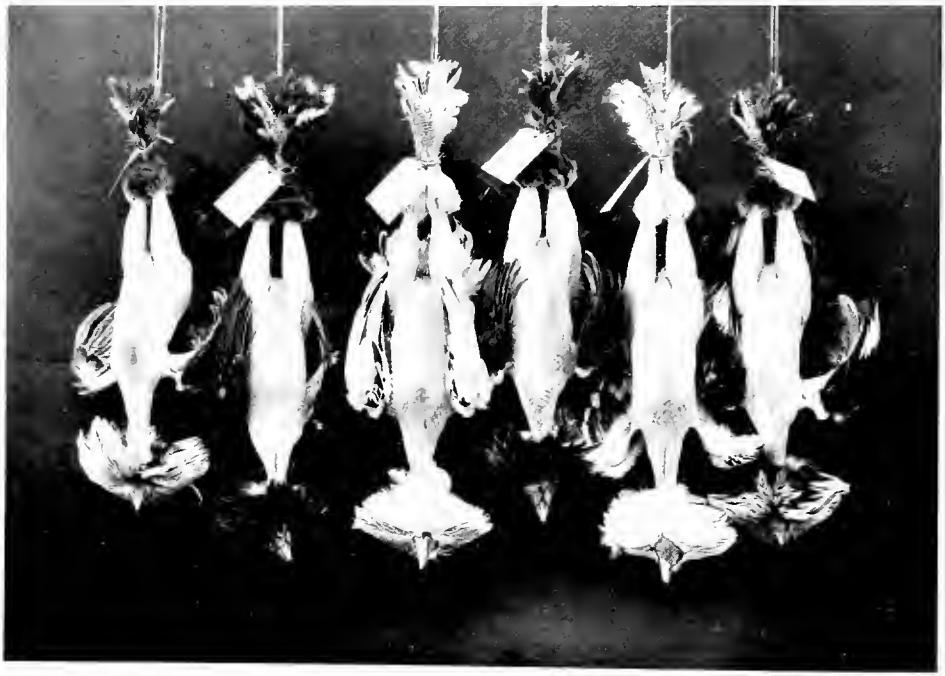
Doctor Richard Schmidt, a well-known American breeder, says: "In the spring of 1891 I caponized 167 cockerels, ate a good many, treated several of my friends to a Capon dinner that Christmas, and shipped a barrel of Capons to New York City, from which I realized $31.50 net profit. There were twenty Capons in the barrel, and they dressed 210 pounds at about eleven months old. They were incubator- and brooder-raised, and fattened like pigs, in a row of coops each 18 x 18 inches and 2½ feet high, giving them all the corn and wheat they could clean up.

"The mortality of Capons in 1891 was 1.67. I lost two out of 167, one being my first and the other my fifth. The latter was lost on account of the use of a pair of scissors with which I thought to facilitate the operation. Having a very rebellious spermatic cord to twist off, I snapped it in two with my scissors, since which time I have had no use for scissors in caponizing, for my would-be Capon passed quietly away, a victim of "*hemorrhagica interna arteria spermatica*," a very easy and apparently painless death. Since 1891 I have caponized some cockerels each year, both for myself and my friends."

A large buyer of poultry in Iowa recently wrote the editor of the *Reliable Poultry Journal* as follows: "To dispose of the cockerels which usually predominate in the hatches at a profit has been one of the problems for the poultryman and one that he has not completely solved. Caponizing offers to him a new and fertile field of operation, one that will yield him great profits and whose hidden treasures cannot be exhausted, as food is always a staple. By the process of caponizing one bird can with less cost to the producer be made to bring from sixty to eighty-five cents. A dozen birds can be made to return from seven to nine dollars. One

buyer here paid out $2,347 for Capons alone in December, January and February, 1896-97. One farmer's wife that winter brought in 100 Capons that brought her $90. The next season she sold 110 for $97.50. When Capons bring from ten to twelve cents per pound at our depot, while hens sell at five to six cents per pound, the wisdom of caponizing is plain."

The photograph reproduced herewith shows just how Capons should be dressed for market. The feathers are left on the neck, legs, wings and



Photograph by courtesy of New York State Experiment Station

CAPONS DRESSED FOR MARKET AT THE STATE EXPERIMENT STATION AT GENEVA, N. Y., SHOWING MANNER OF LEAVING FEATHERS

rump, as well as the tail. Otherwise Capons should be dressed the same as other fowls, except that they should be dry-picked. It would be impossible to scald them and leave part of the feathers on. If scalded, Capons bring no more than other fowls. They are distinguished more by the way they are picked than any other manner. Capons are in the best demand in the Chicago market from November 1st to May 1st. Highest prices usually prevail from January to May. The larger the birds the more they bring per pound. Capons that weigh less than seven pounds

do not bring any more, as a rule, than common fowls. If well-bred, a Capon may weigh from twelve to fifteen pounds. Such a bird will sell for two to three dollars, while a cock of the same size will not bring more than fifty cents.

When raising Capons the breed should be carefully considered. The operation should be performed before the bird is three months old. P. H. Sprague, a prominent dealer in Chicago, says: "The largest Capons, according to our information, are produced by crossing a Dorking male with Brahma hens; the best in quality are produced by keeping the pullets of the Dorking-Brahma cross and mating them with an Indian Game male. Capons thus produced combine the size of the Brahma, the compactness of the Dorking and the full breast and juicy qualities of the Indian Game. Other good crosses may be made by using a Houdan male and Brahma, Cochin or Plymouth Rock hens. The Dorking or Indian Game may be used in place of the Houdan. The hen should always be large. The form and quality are mostly derived from the size.

"A Capon grows and fattens on a small amount of food. The first point should be to secure large frames, and fatten them after they are fully matured. If the Capon is produced from a large breed it should have plenty of time for growth—about fifteen months—for every pound is valuable. The food should be nourishing, but not fattening. Corn is unnecessary until near the time for fattening. Wheat, oats, pounded bone, meat, milk and green food, all that it can eat twice a day, will be sufficient to help Capons rapidly in growth.

"Capons should be put in a small yard (not too crowded) three weeks before being sold, and fed four times a day, giving plenty of corn and also a variety of other food. One of the best preparations for fattening Capons is corn-meal and ground oats, equal parts, adding half a pound of crude tallow to every quart of the mixture. Moisten the whole with skimmed milk or boiling water and season with salt.

"Buyers are not so particular about the size of the legs and skin of the Capon as they are of its size and attractive appearance in other respects, yet a yellow-leg Capon holds an advantage. Yellow legs may be secured by using Plymouth Rock males on pullets that have been produced by mating a Dorking male and a Brahma hen. Such a Capon will be of excellent quality and will always bring a good price. Light Brahma males are also mated with Cochin hens in order to secure large Capons,

but they do not have that full breast which is imparted by the Houdan, Dorking or Game. If the color of the legs is of no consequence, the Houdan male and Langshan hen produce excellent Capons when mated.

"The comparison of a well-bred, well-kept and well-fed Capon with a cock of the same breeding will show that where a cock reaches ten pounds weight in a given period of time the Capon will weigh one-third more, and the difference in price is three to four times as much. If, instead of keeping the yards full of useless and unprofitable cockerels, caponizing were resorted to, there will be a greater desire to have more cockerels hatched than pullets. By keeping good breeds, neighbors may be induced to use the eggs for hatching purposes. Then the surplus cockerels may be bought at a slight advance, as they will prefer to keep the pullets for their own use. By then providing the neighbors with pure-bred males every season there would be no limit to the supply of eggs for hatching cockerels for Capons."

Several years ago the New York Agricultural Experiment Station, at Geneva, conducted a series of experiments with Capons, under the direct supervision of Doctor William R. Wheeler. In his report (Eleventh Annual Report of New York Agricultural Experiment Station) on this work he says: "The much higher prices at which Capons are quoted, compared with those of the average of poultry, have led to many inquiries being made in regard to the profit in growing them for the market. When we remember that beef cattle have been fed in this State during recent years at very small profit, and that often to find any profit in producing pork it has been necessary to take into account the advantage of using skim milk, etc., and to consider the manurial value of the grain fed, we may find it well worth while to learn the cost of any possible animal product of the farm that will command a good price in the market."

In this report Doctor Wheeler records the results obtained in feeding several lots of Capons for the months during which they are usually grown, beginning in August and September, when young cockerels are old enough for caponizing, and continuing until February, at which time the birds are so nearly mature and the growth becomes so slow that it is only a question of holding them longer or not for higher prices.

In the feeding trials, Doctor Wheeler says, skim milk was as profitably fed to Capons as to young chicks. With every lot, sweet skim milk was fed during nearly all the time in place of water, and much of the time

constituted about sixty per cent. of the total food. Of the water-free substance consumed, the skim milk supplied from nine to nineteen per cent., generally from twelve to fifteen per cent. Fowls of several breeds and a few crosses were used: Light Brahma, Buff Cochin, Plymouth Rock, Black Langshan, Indian Game, Indian Game-Light Brahma cross, Indian Game-Buff Cochin cross, and White Plymouth Rock-Black Minorca cross.

The cockerels were caponized at an average weight of 3.8 pounds. The average weight of those caponized at smallest size (Barred Plymouth Rocks) was 2.7 pounds, and of those at largest (the Light Brahma) 4.8 pounds, when the operation was performed. While the former recovered from the operation much more rapidly, the latter made, after recovery, much the more rapid and profitable growth.

The average loss in weight from the thirty-six hours' fasting and operation was 11.2 per cent. Within five days thereafter the birds had generally recovered the weight lost, so that seven days from the time of the removal found the cockerels back in the pen as Capons at the same weight (the average showed a slight increase of three-tenths per cent.), with but the additional cost for food of that consumed during the five days.

"No bird among those grown at the station died during the experiments directly on account of the operation. The loss of one, some weeks after caponizing, was due more to an oversight in after-treatment than to the direct effect of the operation itself. To make sure of killing no birds, it is occasionally necessary to leave some with almost the assurance of their developing into slips. Even the most expert professional operators expect to kill a few birds.

"The excess that the average market prices show over the cost for food, however, is enough to promise a fair profit, over an ordinary per centage of loss, for any reasonable investment of labor, etc. The cost of caponizing where the services of any expert operator can be obtained is but a few cents per fowl, sometimes as low as four cents. After a fall in the high broiler prices of spring and early summer, it will probably be found more profitable to caponize the surplus cockerels than to market them, especially where cheap skim milk and grain are to be turned into a market product. For while often the per centage of profit over the cost of food in selling at broiler age is greatest, the actual difference per fowl in market

price over cost of food is greater with the Capon, providing the latter is sold before growth has ceased. After caponizing, the labor in caring for and feeding is but little more than in feeding cattle or pigs, and the proportion of labor to produce one hundred pounds of Capons is therefore less than in the production of one hundred pounds of broilers, as the latter have most of the time been with the hen or brooders.

"As the demand for Capons does not come from those who are looking for the cheapest possible animal food, it is evident that effort should be made by any grower toward improvement in quality, and the most successful and profitable competition will probably be in this direction.

"It is better to use only the larger breeds for Capons, and the Brahmas and Cochins are among the best, but while these breeds furnish poultry of superior size and excellent quality, there is, compared to the Game, an undesirable deficiency of breast development which is plainly noticeable in the dressed fowl. At the New York Poultry Show in 1892 the first prize was given by a competent judge to a Capon eight and one-half months old of Indian Game-Buff Cochin cross over Capons young and old of Light Brahma, Black Langshan, and two or three other breeds and crosses. A cross of the Indian Game gives nearly as large fowls as the pure breed, with much of the Game shape. This cross can probably be used with advantage, for the Indian Game, while larger than the pit Game, has little of the fighting spirit of the latter, and, having yellow skin and legs, will not interfere with the common prejudice in that direction. It is not probable, however, that, did such prejudice exist in a market demanding the best of Capons, it would be hard to overcome where good fowls of such breeds as the Dorking, Houdan, La Fleche and Langshan were to be had.

"The labor required in feeding Capons is less than with young chicks. The cost of caponizing is small where expert services can be obtained, and an expert should be employed where possible. The methods of operation can be learned from the printed instructions accompanying several of the different sets of instruments advertised and sold, but any one endeavoring to teach himself should operate on several dead cockerels before attempting to operate on a live one."

Directions for Caponizing

The following complete and interesting account about caponizing is taken from *Success with Poultry*. From twenty-four to thirty hours

before preforming the operation, select such cockerels as you intend to caponize (these should be from two to four months old), confining them in a clean and airy coop or room without either food or water. The best time to confine them is at early morning, as their long fast will then end about noon of the following day, at which time the operation is best performed. Should the day be cloudy or wet, do not caponize them, but let the operation go until you have a bright and fair day. It is necessary that you have all the light possible in the matter. If it be a cloudy day, and you decide not to caponize, the birds may be given a little water and food if necessary, but it is much better to avoid this if possible, as it is very desirable to have their intestines quite empty, thus allowing their testicles to be more readily seen, besides giving the operator much more room in which to perform his work. Lay the bird on the operating table (Fig. 8) on its left side. Wrap the cord (Fig. 2) twice around the bird's legs, above the knees. In making one wrap only there is danger of the birds kicking themselves out of the loop. Hook the other cord once around both his wings, close to the body. To the opposite end of these cords attach a half brick, or some other weight, letting them hang over the sides of the table. This holds the bird securely. Have all your instruments in readiness, that you may work quickly. Thread the canula (Fig. 3) with a strong and long horsehair or fine steel wire (we think wire the best), letting the wire form a loop at the curved end, and extend well out at the other end. Now, after slightly wetting the spot, proceed to pluck the feathers from the upper part of the last two ribs and just in front of the thigh joint. Pull the flesh on the side

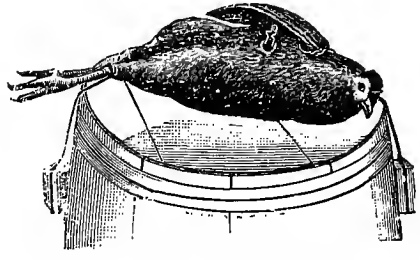


FIG. 1. METHOD OF HOLDING FOWL READY FOR CAPONIZING

FIG. 2. KNIFE FOR KILLING POULTRY

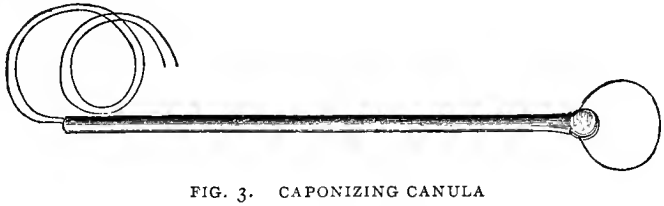


FIG. 3. CAPONIZING CANULA

down toward the hip, and when the operation is finished the cut between the ribs will be entirely closed by the skin going back to its place. While holding the flesh back with the left hand, with the right hand take the knife (Fig. 4) and insert it (cutting edge away from you) between the last two ribs, cutting first down and then up a little way, following the direction of the ribs, making the cut not more than one inch long. Cut deep enough to go through the skin and flesh, being very careful not to go so deep as to cut intestines. There is little danger of doing this, however, if they are empty, as they will be from the bird's long fast. The danger of cutting the intestines is when they are full, as in this state they press against the ribs. Should the cut bleed, stop a moment, let the blood clot on the thin skin covering the bowels, and then remove it with the spoon forceps. Next take the spring spreader (Fig. 5), press it between the thumb and finger until the ends come together, and insert the ends in the incision, with the spring end toward the bird's feet. Upon looking into the cut a thin tissue-like skin will be seen just under the ribs and enclosing the bowels. Take a sharp hook (Fig. 6) and pick the tissue open, so that you may get into the bird with the instruments. The breaking of this skin does not cause the least pain to the bird. One of the testicles will now be brought plainly to view, lying close up to the back of the fowl. Sometimes both testicles are in sight, but this is not generally the case, as the other one lies beyond and more on the other side of the bird, the intestines preventing it from being seen from this opening. The testicle brought to view is enveloped in a film. This should be brought away with the testicle. Some people, in caponizing, tear the skin open and then take the testicle out. The danger in so doing is, that if this skin is left there is danger of causing a "slip."

FIG. 4. KNIFE FOR MAKING CUT

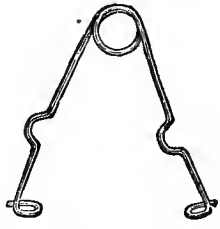


FIG. 5. SPRING SPREADER

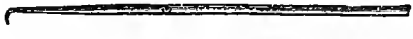


FIG. 6. SHARP HOOK TO OPEN FILM-LIKE SKIN

Now comes the only dangerous part of the whole operation, getting hold of and removing the testicles; but with a steady hand and plenty of light not one bird in fifty should be lost. Attached to the testicle and lying back of it is one of the principal arteries of the fowl, and this, if ruptured,

is sure to cause death. It is here that the canula (Fig. 3) proves of great advantage. The hair (or wire), being small and very fine, is easily slipped between the testicle and artery without injury to either, and a clear, clean cut made. Take the canula in the right hand and adjust the hair (or wire) in it so that a loop about one-half inch long will extend from small end of tube, leaving the two ends of wire extending far enough out of the open end to secure a good hold. Insert the end of the tube that has the loop on it very carefully and slip the loop over both ends of the testicle and entirely around it, holding end of tube close to the testicle. When the testicle is entirely encircled by the loop, take both ends of the wire (or horsehair) which comes out of the other end of the tube with thumb and first finger, holding it tight, and draw up on it carefully but firmly, being particularly careful to have the loop around testicle. Keep the end of the tube very close to testicle all the time. If drawing up on the wire does not at once cut testicle, slightly turn from one side to the other (but not entirely around), then the testicle will come off. After removing it, carefully examine inside of bird to see that no piece is left in, and also to see that no foreign substance, such as feathers, etc., has gotten in. If any have, it is necessary to remove them, for, if allowed to remain, they are liable to cause inflammation. Sometimes part of the testicles or a feather may drop among the bowels; if this occurs, move bowels around with probe (Fig. 7) until the object is found, then remove with spoon forceps. When the operation is performed, remove the spreader at once and the skin will very soon slip back over the cut and heal in a short time. Never sew the cut, as it will heal just the same as any other small flesh wound.

FIG. 7. CAPONIZING PROBE

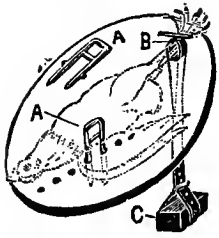


FIG. 8. TABLE SUITABLE FOR CAPONIZING ON A LARGE SCALE

The bird can now be turned over on its right side, cut made, and testicle removed in exactly the same manner as just described for the left side. Both testicles may be taken out with the one incision, but to the beginner we would say this is attended with more difficulty than the two incisions. The other testicle being situated so far over on the other side, there is more difficulty in reaching it, besides danger in piercing artery running back of first testicle. To an experienced person there is

no danger in removing both testicles from one incision, but to those who have not that degree of confidence given by practice we would recommend the two cuts. The bird recovers just as quickly as though one cut were made, and the operation is performed equally as quick, if not quicker. If both testicles are removed from one cut, the lower must always be taken out first, for if the top is first removed the small amount of blood that may follow will cover the lower one, keeping it from view.

The Best Time to Caponize

Fowls hatched early in the spring make the finest Capons. They can be cut before hot weather comes, which is a great advantage, although no ill results follow the operation at any time in the year. The bird should be from two to three months old (not more than six months), and weigh not less than from a pound to a pound and a half. The size is equally as important as the age. June, July, August, September and October are the months generally taken for caponizing, for the reason that spring chickens arrive at proper age and weight for market during the months of January, February, March, April and May, at which times there is the greatest demand for them in the cities, and the highest prices secured. That Capons are in our markets at certain seasons only is because the demand is far in excess of the supply. The time will be when Capons may be obtained the year round.

The top of an ordinary barrel (see illustration) meets all requirements of a table, admits of the birds being easily secured, brings them to the proper height with the operator; in brief, makes as good a table as can be desired. It costs nothing, as there is always an empty barrel lying around, or one that can be easily emptied.

The question is often asked: "How are capons to be fed?" After caponizing, give the bird all he will eat of soft food, and let him have plenty of water. Caponized fowls begin to eat almost immediately after the operation is performed, and no one would think for a moment that a radical change had been made in their nature. Now leave the bird to himself, as for the time being he is his own doctor. It is well to look him over two or three days after the operation, as in breathing the air sometimes gets under the skin, causing "wind puff," or a slight swelling, in other words. Simply prick through the skin at the sides with a sharp needle, gently pressing at the same time, when the

air will be expelled and the Capon relieved. Within ten days from the operation the wounds will be healed over. A day or so after caponizing, the bird should be allowed to run at large, treating him just the same as any growing poultry would be treated.

Killing and Dressing Capons for Market

The Capons should be allowed to grow until at least one year old. By this time they will have attained an imposing size. Some keep them even longer than a year. While this is optional with the raiser, yet we would not advocate killing them under one year old if they are being raised for market. There is a great difference between the dressing of Capons and an ordinary fowl.

When the capons are ready for market, select such as you propose killing, and confine them. Keep them without food or water for about twenty-four hours before killing, that their crops may be entirely emptied. Now get ready your place for killing and dressing the fowls (if you have conveniences in the chicken house, this will do quite well, or the wood-shed, or any cool outhouse), and drive two heavy nails or wooden pins about one foot or less apart in an overhead beam. Make two nooses of strong string, each noose long enough to hold one each of the legs, and have the Capons hang low enough to pluck with ease. Have a weight of two or two and one-half pounds attached to a hook, and when the bird is killed fasten this hook in his lower bill after you hang him up for plucking. The weight holds the bird in position while picking and renders the operation much easier.

Next, procure a table to dress the fowl upon, and make a frame on the same principle as a small box without the ends and cover. In this you lay the Capon, back down, to remove the intestines.

When everything is in readiness, take your Capon and suspend him by the two legs from the nooses. Catch hold of his head, and with your poultry-killing knife (Fig. 9) cut vein at back of throat, through the mouth. Never cut this from the outside. Immediately upon cutting vein, run point of knife through roof of the mouth clear into the brain. This operation causes what is termed "dropping the feathers," making them come off more easily. As soon as

FIG. 9. KNIFE FOR KILLING POULTRY

the knife enters the brain the bird loses all sense of feeling. Begin plucking at once.

As to the style of dressing, the feathers are left on the wings up to the second joint, the head and hackle feathers, also on legs half way up to drumsticks, all the tail feathers, including those a little way up the back, and the long feathers on hips close to tail. These feathers add greatly to appearance of the bird when dressed, and are also a ready marker from other fowl in markets. Never cut the head off, as this is a distinguishing feature of the bird. A Capon may readily be identified among a thousand cockerels, as the comb and wattles cease to grow immediately after caponizing is performed. Wash head and mouth well with cold water, being careful to remove all blood. A Capon should not be torn in plucking. There is no danger of this happening if proper care be taken. Place the plucked fowl back downward in the box frame already described. Cut carefully around the vent and pull out the intestines. These will be found covered with fat, which, as they are pulled out, should be pushed back. When the end of the intestines is reached, insert your finger and break this off, leaving everything else in. As may be expected, the fat will be found very heavy around the opening, and if slightly turned outward will soon become hard, which will give a rich appearance in this portion of the bird. Let the birds hang in a clean, cool place until thoroughly cold. For packing, use a new box of the required size, lined with white paper (any good, clean paper will do). Pack the birds in solid, back up, being careful not to bruise them. Your birds are then ready for market. With a bird not torn and the feathers properly left on, you have a fowl which for inviting and "taking" appearance it is impossible to equal.

A "slip" is neither Capon nor cockerel. He is much inferior to the former and a great deal worse than the latter. The "slip" is caused by not entirely removing the testicles. The smallest fraction left in the bird will grow again with no benefit to the fowl.

Our first advice would be, "Keep cool and make haste slowly." If you are rather tenderhearted, read the directions over carefully and then try your hand on a dead fowl. All surgeons do this in the first place, and probably it would be as well for you to follow their example. Have plenty of light. It is impossible to properly perform the operation unless you have this. After your first performance of caponizing you will be

surprised at its simplicity. Always keep your instruments in perfect order. Before using the knife, see that the edge is sharp, and that the other tools are as they should be. After beginning the operation of caponizing there should be nothing to hinder you from going right ahead.

Photograph by courtesy of "Commercial Poultry"

SINGLE COMB BROWN LEGHORN COCK
Owned by W. G. Warnock, Illinois

BUFF SHANGHAI COCK. (FIRST PRIZE.)

The property of the late Mr. Parkinson. *The winner of many prizes.*

The Poultry Book

By
HARRISON WEIR, F.R.H.S.

American Edition Edited by
WILLIS GRANT JOHNSON
Assisted by
GEORGE O. BROWN
as Associate Editor
and
Many American Experts

Complete in Eighteen Parts

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1904

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This book has been revised and partly rewritten from the American point of view by American experts.

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"The Common Diseases of Poultry"
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"Principal Insects Infesting Poultry"
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PRACTICAL POULTRY HOUSES*

A. F. HUNTER, MASSACHUSETTS

IN THIS CHAPTER on poultry houses the purpose has been to present plans which have approved themselves in the experience of practical poultrymen, and to give a sufficient variety of plans so that every one's taste and circumstances may be suited. In recent years the tendency in poultry house construction has been toward a better supply of fresh air, especially during the day, when the fowls are naturally active and are exercising; hence the prominence given to house plans which combine a curtained-front scratching-shed with a close roosting-pen, or give a more or less open-front scratching-roosting pen, at the discretion of the attendant. The most essential points in a poultry house are shelter, warmth, sunlight and fresh (pure) air; and that plan is best which judiciously unites these essential points.

1. *Essentials to success in the poultry business.* Poultry keeping is an exacting business. The four corner-stones upon which success rests are:

(1) Suitable buildings properly located.

(2) The right food skilfully fed.

(3) Good fowls carefully bred.

(4) Facility and ability to hatch and rear chickens.

To these should be added a willingness to work, love for the business, good common sense and marketing ability. Not the least in importance is the matter of building the poultry plant.

1. *Location.*—The location should be dry. If the ground is not dry naturally, it should be made so by drainage. Damp ground means cold ground, because rapid evaporation cools the soil. It also means

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unhealthful soil, because the air and sunshine cannot penetrate to purify it. Muddy ground means dirty feet, and dirty feet make dirty eggs.

Air drainage is as important as soil drainage. Cold air settles in low places. A low place, though more sheltered from the wind, may be many degrees colder than a higher spot a few rods distant. Therefore avoid locating poultry houses where cold strata of air can settle. Secure warmth by building in the lee of a windbreak or in front of farm buildings or a hill. Buildings that face the south will get the largest amount of exposure to the sun's rays. Other things being equal, they will be warmer and dryer and more cheerful. An exposure from two to four points east of south will give the most shelter from the prevailing west and northwest winds of winter, and is the exposure most preferred by experienced poultrymen. An eastern exposure is usually preferable to a western exposure, barring prevailing winds from the east, because, like flowers, hens prefer morning to afternoon sun.

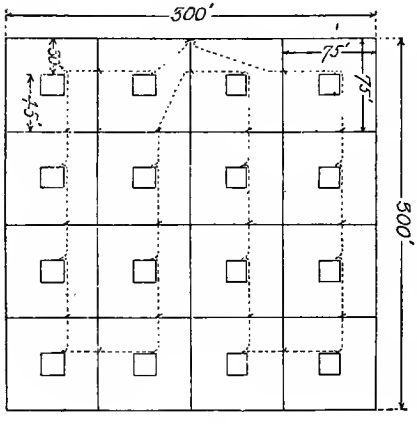


FIG. 1

2. *Steps may be saved by studying the form and location of the building.*— The form and location of poultry houses have much to do with their convenience. Time is money. Therefore a poultry plant should be built with a view to saving steps. With this point in mind a man would have to walk 1,320 feet to go the rounds of the sixteen houses shown in Figure 1. Most men feed their fowls three times, water once, gather the eggs once and clean house once daily, making six trips a day, which would require the attendant to walk 7,920 feet a day, or 547 miles a year. Walking four miles an hour, it would take 136 hours; and at 12½ cents an hour would cost

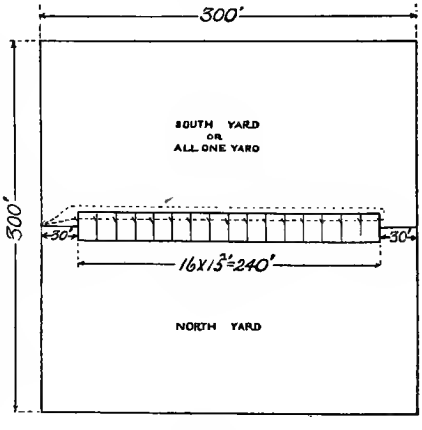


FIG. 2

$17. If the sixteen houses are brought together into one continuous house (Fig. 2), the attendant would make the round by walking 540 feet. Six trips a day would make 3,240 feet a day, or 223 miles a year, taking fifty-five hours and costing $6.97 per year, a saving of 324 miles, of eighty-one hours and of $10 a year. A horse and cart to carry the feed and water, eggs, litter, cleanings, etc., in case of the colony plan, and a trolley through the continuous house, could be made to save two or three trips a day—reducing the amount of travel proportionately.

4. *The form influences the cost of construction.*—Houses built on the colony or separate plan cost more to build than a continuous house of the same capacity. (Figs. 1 and 2.) One end of each house is saved by bringing them together. Supposing the buildings to be fifteen feet wide and six feet high on the sides, the lumber saved would amount to 127½ feet for one house, equal to 2,040 square feet for sixteen houses, and if double-boarded such buildings would require 4,080 feet, besides other materials and cost of building. The colony houses are much cooler because more exposed.

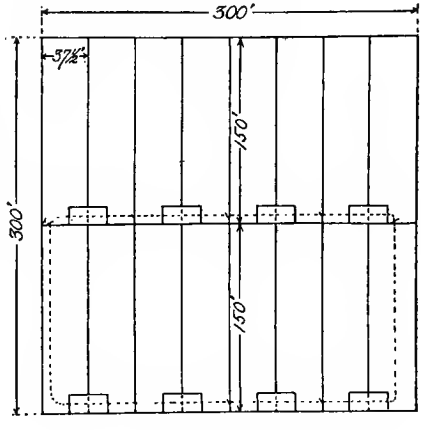


FIG. 3

5. YARDS: *Fences are expensive and increase labor.*—To fence separate yards for the pens (Fig. 1) would require twenty-seven and a half rods of fence, which would cost about $20. Every time a division fence is taken out each flock has twice as much liberty as it had before. When all the division fences are removed each flock enjoys sixteen times as much liberty as it had before. Fences increase labor. The labor of cultivating and seeding sixteen yards is much greater than it would be if all were in one field. Again, one would have to open and shut about one hundred gates a day in caring for the stock in buildings arranged as in Figure 1. Large flocks can pasture in the same field. Hens know enough to return to their own roosts. The biggest bump on a hen's head is the bump of location!

A strong argument in favor of yards, however, is the fact that fowls lay better when not permitted free range. When kept in semi-confinement

in yards sufficiently large for healthful exercise, the physical energies are not dissipated in ranging, but are conserved for egg-production. This is upon the same principle as the keeping of milch-cows upon the soiling plan, giving all needed food at the stable and permitting from two to four hours' exercise in a paddock daily: sufficient exercise for good health, but no ranging in search of food.

6. *Features of large and small yards.*—As a rule, make them long and narrow. Double yards are desirable (Fig. 2). They allow one to rotate green crops. This practice converts the filth which would become a source of danger into a valuable food crop. (Note house and yard plans in subsequent pages, especially the north-and-south-yards plan, page 285.)

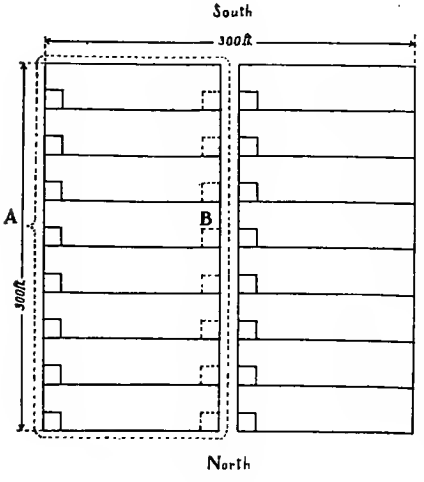


FIG. 4

Where several breeds are kept or many small breeding-pens are desired the following plans are suggested to save steps (Figs. 3 and 4). The shape of the fields, the slope of land and location of the other farm buildings will have much to do with the shape of the yards and mode of access to the buildings. Generally, the yards should be long and narrow, to facilitate cultivation. Two rods wide and eight rods long is a good size for forty or fifty hens, although more room would be better. This permits a row of fruit trees in the center for shade, which is a necessity. If the nearest point of access should be from the north (Fig. 4), it would be better to have the houses on the west at B instead of at A.

7. *Small flocks lay best.*—Ordinarily, we expect to get more eggs from a small flock than from a large one. But every time we double a flock we divide the labor. From forty to fifty seems to be about as large as it is safe and economical to keep together. If more are together the weaker are crowded and the individual is lost sight of.

8. CONSTRUCTION: *The working unit in building a hen house is the floor and air space required for each hen.*—A safe working rule is about five to six square feet of floor space and from eight to ten cubic feet of air

space for every fowl. The lighter breeds, because more active and restless, require about as much room as larger breeds.

Foundation walls should be built deep enough to prevent heaving by the frost, and high enough to prevent surface water from entering. Sometimes grout walls may be made with gravel or small stones where large stones are scarce; or, in the absence of foundation materials, the building may be set upon posts.

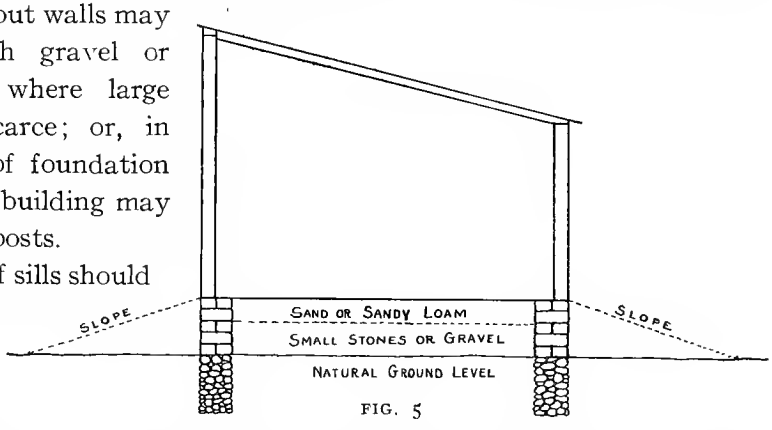


FIG. 5

Bottom of sills should be one and one-half feet above natural ground level (Fig. 5), and the ground outside should be sloped down from bottom of sills so as to turn away surface water. Inside, the pens may be filled to the depth of a foot with small stones or coarse gravel; then about six inches of dry, sandy loam or fine sand. This loam (or fine sand) should be carted off and the earth floor renewed with fresh material every summer, at the annual house-cleaning.

9. *Square houses economize lumber.*—The nearer square a house is —other things being equal— the less lumber it will require. (Fig. 6.) It is seventy-two feet farther around house A than it is around house E, both having the same number of square feet floor space. If the sides of the house are six feet high, then one thickness of boards would take 6 x 72=432 feet. If the house is double-boarded it would be twice as great, *i. e.*, 864 feet, besides the extra material required for seventy-two feet of frame-work, building paper, nails, labor, foundation, etc. The long, narrow house is colder because it has 432 square feet more of exposed surface.

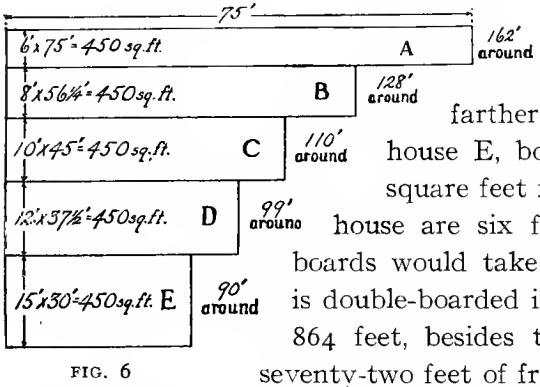


FIG. 6

10. *Cost and value affected by form of roof.*—The shape of the roof

affects the value of a poultry house. It takes the same amount of material to build a gable roof—a one-pitch roof or a combination roof, if the pitch of the roof and the ground plan are similar. (Figs. 7 and 8.) The shape of the roof influences the cost of the sides of the house. If we assume that the window is six feet high in a building fifteen feet wide, it would be necessary with a gable roof to have both sides of the house the same height, which makes more interior air space than is necessary and requires the rear wall one and one-half feet higher than would be needed with a one-pitch or combination roof. A one-slope roof will cost the extra lumber to build three feet higher in front than is required by the combination house. If an alleyway should be desired along the back side of the house, or if a large garret space is desired, the gable-roof style of house will be the most economical to build.

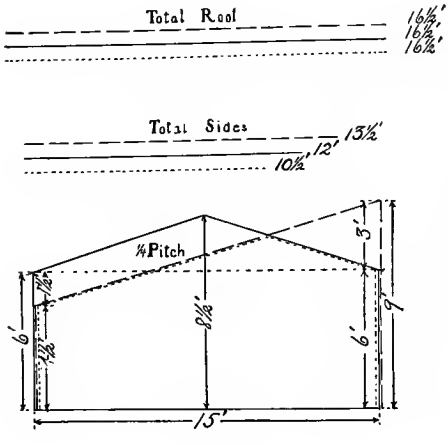


FIG. 7

In order to build the three styles of houses, each taking the same amount of material and having the same pitch of roof and floor space, they would be as seen in Figure 9, which would make the one-pitch roof too low in the rear for convenience. The steeper the pitch, the greater the comparative expense of building a shed-roof house, as compared with the gable or combination roof house (Figs. 7 and 10). The steeper the roof the greater the cost for roofing and the longer it will last. Most roofs can be one-fourth pitch. Shingle roofs should generally be one-third pitch.

11. *Each form of roof has its advantage and disadvantages.*— The single-span roof is the easiest to build. It gives the highest vertical front exposed to the sun's rays, which are reflected back, drying the ground and making a warm shelter. It throws all the rain-water to the rear, lessening the length of eaves-trough one-half, and keeping the front of the house dry, where no eaves-troughs are used. It allows the windows to be

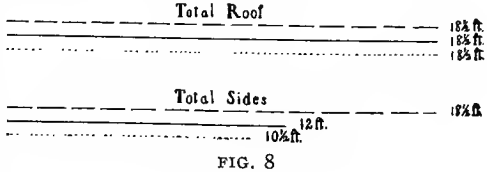


FIG. 8

placed high up. A tarred-paper roof will last many years longer if the slope is toward the north. It is cooler in summer if not exposed to the vertical rays of the sun. The gable roof provides for a large garret space which can be stuffed with straw, making the house warmer and drier. The combination house shares in the advantages and disadvantages of each of the others.

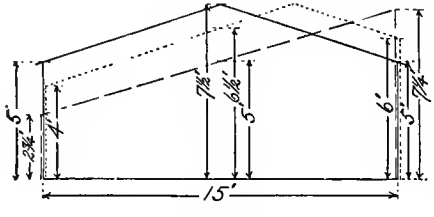


FIG. 9

12. *Alleyways are expensive and do not always economize labor.*—They occupy from one-fourth to one-fifth the entire space of the house, which would accommodate from one-fourth to one-fifth more hens or would give the regular number of hens from one-fourth to one-fifth more room. From twenty to twenty-five per cent. of the total area of a building is too much to pay for a free passageway.

Every time one enters the pen from the alleyway he opens and shuts twice as many doors as he would in a similar house without an alleyway, if one passes from pen to pen and returns outside (except in case of a full section scratching-shed house). (See Fig. 11, A and B.) If alleyways are boarded up tight one cannot see the fowls without opening the doors. If they are not tight they encourage drafts.

The nesting and roosting conveniences can be so arranged that most of the work may be done from the alleyway, which might be a saving of labor. But in so doing one would not be among his fowls, which would be a decided disadvantage.

Long houses should always be divided by tight partitions, either cloth or board, between every two pens at least, to avoid drafts. Otherwise, cold and dangerous air-currents will be formed whenever windows, doors or ventilators are open.

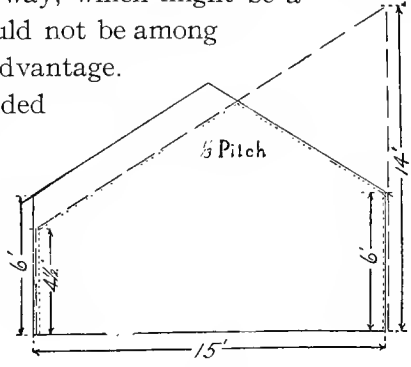


FIG. 10

13. *Sunlight is a necessity.*—It carries good cheer and tends to arrest or prevent disease. Too much glass makes a house too cold at night and too warm during the daytime, because glass gives off heat at night as readily as it collects it in the daytime. Much glass makes construction expensive. Allow one square foot glass surface to

about sixteen square feet floor space if windows are properly placed. The windows should be high and placed up and down rather than horizontally and low. (Fig. 12.) In the former the sunlight passes over the entire floor during

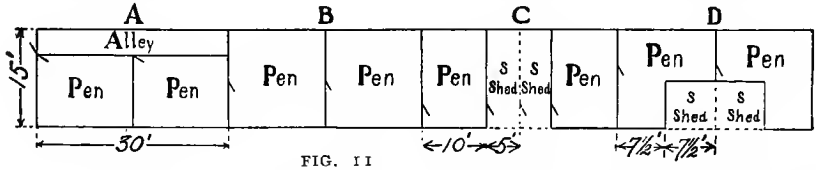


FIG. 11

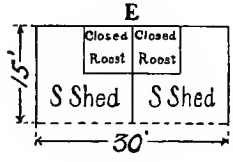


FIG. 11

the day from west to east, drying and purifying practically the whole interior. The time when sunshine is most needed is when the sun is lowest —*i. e.*, from September 21st to March 21st. The arrows in Fig. 12 represent the extreme points which the sunshine reaches during this period with the top of a four-foot window placed four feet, six feet and seven feet high, respectively. With the highest point of the window at four feet, the direct sun-rays would never reach farther back than nine feet; at six feet it would shine thirteen and one-half feet back, and at seven feet it would strike the back side of the house one foot above the floor. Window sash with small glass seriously obstruct the light. Very large lights break too easily and are more expensive; 8 x 10 is a good-sized glass to be used in twelve-light sash, making it about three feet nine inches high by two feet five inches wide. Use two of these for a house about fifteen feet square.

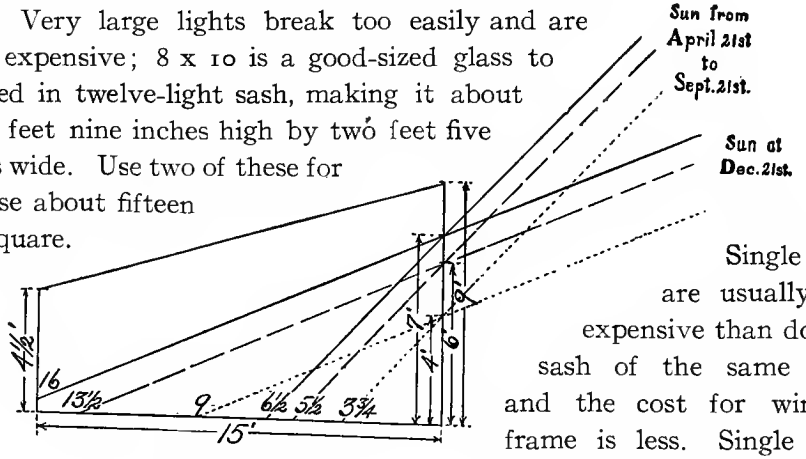


FIG. 12

Single sash are usually less expensive than double sash of the same size, and the cost for window frame is less. Single sash may swing from the side or top, or be made to slide to one side. They can be opened and closed quickly and completely, and are against the wall, where least apt to be broken. With double sash this is more difficult.

Whitewashing the inside of a house makes it as much lighter as would an extra window.

14. *Extreme temperature may be modified by careful ventilation.*—It is as important that houses be kept cool in summer as it is that they be kept warm in winter. Therefore remove windows in hot weather. Curtains over windows, though adding to trouble and expense, can be used to advantage during the night in the coldest weather and during the day in the hottest season. Hens must be kept comfortably warm. This

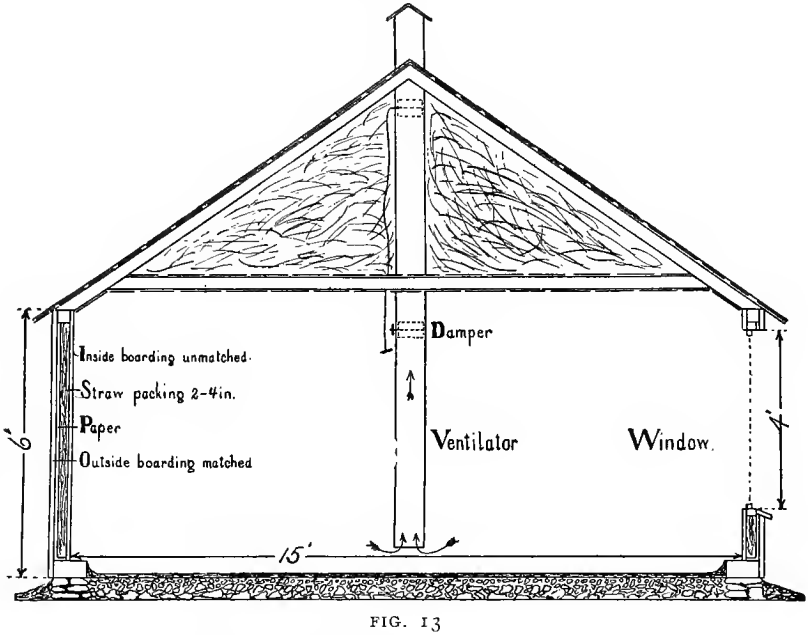


FIG. 13

is particularly true at night, when the body is less active. The great difference between summer, when hens naturally lay most eggs, and winter, when they always lay the least eggs, is a difference in temperature and sunshine. Therefore we must build our poultry houses so that we can, as far as possible consistently with cost, overcome this condition.

15. *A low house is warmed more easily than a high one.*—Solid walls radiate heat rapidly. The best way to make a poultry house warm is to build it as low as possible without danger of bumping heads. There will then be ample air space for as many fowls as the floor space will accommodate. Too much air space makes a house cold; it cannot be warmed up by the heat given off by the fowls.

With the house as seen in Figure 13, 15 x 15 x 6 feet, there would be 1,350 cubic feet of air space, which, with forty hens weighing five pounds each, would allow $9\frac{5}{10}$ cubic feet to each pound live weight. This is eight times greater than is recommended for each pound live weight for other animals. The gable roof alone has 562 cubic feet air space, or $2\frac{8}{10}$ cubic feet air space to each pound live weight.

16. *The walls should furnish insulation.*—Matched lumber is cheaper in the end than unmatched with battened sides. Planed lumber will pay for extra cost in the saving of paint and brushes. For durability, painting buildings may not pay, but for appearance's sake it is desirable. Line with tough building paper, always making the laps tight. Make the walls double, with the space stuffed with straw, rather than have a so-called dead air space or the same material built solid together. (See Fig. 11.) With the solid wall heat passes through rapidly. The same is true of a dead air space, where the air becomes as cold as the outside boarding, and in turn, by direct contact, cools off the inside boarding. This occurs less quickly when the space is stuffed with non-conducting material. Stuffed walls will not be necessary over the entire house except in the very coldest sections, or the coldest sides in the milder sections, and not at all farther south. It costs about the same to build a double-battened wall with unmatched boards solid together, with paper between, as it does to make two single walls of matched boards with one lining of paper and the space stuffed with straw. With vertical boarding every board serves as studding and saves expense.

17. *Dampness is fatal in hen houses; drain to promote dryness.*—Better by far to have a cold, dry house than a warm, damp house. The warmer the air the more moisture it will hold. When this moist air comes in contact with a cold surface, condensation takes place, which is often converted into hoar-frost. The remedy, therefore, is to remove the moisture supply as far as possible by first cutting off the water from below which comes up from the soil. The water table is the same under a hen house as it is outdoors. Dirt floors are therefore damp. Stone-filling covered with soil is hard to clean, and only partially keeps out dampness, unless raised considerably above the natural ground-level, as shown in Figure 5. Board floors are short-lived if the air is not allowed to circulate under the house. If the foundation walls are not tight the floors are cold. In any case, they harbor rats. A good cement floor is nearly as cheap as a good

matched board floor, counting lumber, sleepers, nails, time, etc. When once properly made it is good for all time. It is practically rat proof, easily cleaned and perfectly dry, cutting off absolutely all the water from below. An objection to cement floors is that rats may burrow under them and so undermine them that the floors break through when stepped on by a man. We have seen cement floors so badly broken they had to be dug up with a pick and relaid. If covered with a little soil, or straw, or both, as all kinds of floors should be, it will be a warm floor. Make cement floors by filling in with small stones or coarse gravel, if possible, for drainage. Then work in and smooth off about from one to two inches of mortar, made by mixing thoroughly, while dry, one part good cement to three parts sharp sand, then wetting and thoroughly mixing again and again and again. Other things that can be done to keep dampness out of the air is to use absorbents, like dry dust or land-plaster (ground gypsum), or South Carolina rock on the droppings (which should be frequently removed), and by keeping plenty of dry straw or buckwheat hulls on the floor or for litter overhead.

18 *When air is warmed it expands and rises. Cooling has the opposite effect.*—Damp air may be removed by ventilators, which will necessarily make the house a little cooler. Warm air rises. Therefore the best ventilator is one that has an out-take near the floor, with a tight galvanized iron shaft leading up through the warm air of the house to the roof and out at the peak. The metal, being more quickly affected by heat, will cause currents of air in the shaft to rise more quickly. (Fig. 13.) The intake air should be received from the bottom on the outside and conducted to the ceiling before being allowed to enter the room. This avoids direct drafts and causes a circulation necessary to the removal of moisture. The less the difference between the inside and outside temperatures and the quieter the air the more difficult it is to ventilate. The tighter and warmer buildings are made the easier they are to ventilate. The larger the amount of air space the less need there will be for ventilators, provided there is a change of air through windows or doors during the day. (See King, on "Ventilation.") Stuffing the sides and roof of the house with straw to prevent condensation of moisture will help to keep the moisture in the air so that it can be removed by ventilation. Pure air is as necessary to good health and good egg-production as are pure food and pure water. It will require a perfect system of ventilation and considerable personal

attention to keep the air in a poultry house as pure as it would be outdoors; it will, therefore, often be found advisable to adopt the scratching-shed

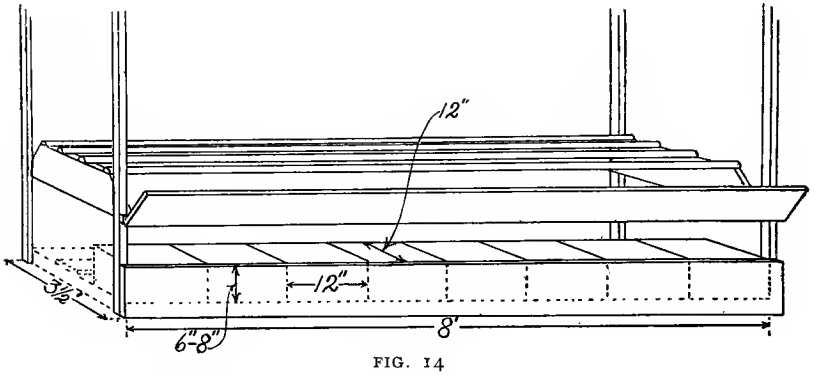


FIG. 14

plan of house, which allows fowls some discretion in choosing an open-air temperature.

19. *Exercise is necessary to insure health; scratching-pens provide for this.*—Hens do not like confinement. The fact that hens can go in and out freely from house to shed seems to be a deceptive form of liberty which they crave, and which is not provided in a single close compartment house. The fact of having been in the cooler air during the daytime seems to make the fowls less affected by the cold of night. In practice they are generally found to be more healthy and to lay more eggs in a year when proper scratching-sheds are provided. The relative size of the shed and closed compartment will depend upon the location. The farther south, the larger the scratching-shed and the smaller the closed pen, even to the extent of having all open sheds with cloth fronts and with hooded roosts. Such houses are far warmer than is generally supposed. The farther north one goes, the smaller the scratching-shed and the larger the closed compartment should be, until in very cold sections the open shed might be entirely undesirable. Ordinarily, they should be about equally divided.

There are several ways to provide scratching-sheds, each one possessing some advantage over the others. Figure 11 shows three styles. Plan C has the advantage of a scratching-shed as deep as the house, which is thus better sheltered from the wind. It has the disadvantage of having more doors to open and close in passing through a long house. Plan D does away with two doors, thus saving time, and is no more expensive to build,

but is more exposed to the wind, and will make a somewhat dark corner unless a window is placed at the back of the scratching-shed. Plan E is all scratching-shed except a small, warm roosting-room. This would be a little cheaper to build, but would not be adapted to the coldest sections. The fronts of the open sheds should generally be provided with heavy cotton cloth doors to keep out sleet and snow during heavy storms. They may be hung at the top and raised by a pulley, or sliding doors with cloth windows can be used. Hens are easily frightened. Anything that causes uncertainty or suggests danger retards egg-production. Therefore every house should provide a retreat. This is done by placing the opening through which the fowls pass to and from the shed and the house at the rear side instead of the front side of the partition (Fig. 11, C). When any one approaches the shed the hens retreat, without alarm, to the house, or to the shed if the alarm were to come from the other direction. Placing the opening at the rear side also prevents the wind from blowing into the house. It should be raised eight inches above the floor to prevent the litter from being scratched out.

20. *A dust-bath is as essential to a hen's health and happiness as a water-bath to a human being's.* —By it they scour off the scurf and scales from the skin and rid themselves of vermin. The finer, lighter, drier dust is the better, because the dust must be light and fine to get into the breathing-pores of the lice to kill them. Sandy loam is often better than sand or some kinds of road dust, which are cold and heavy; wood ashes and coal ashes lighten it up. The best place for the dust-bath is in the open air of the scratching-shed. Here the dust quickly settles, and the hens that are not dusting are not compelled to breathe it. Fowls are apt to stand upon the edge of a dust-box and befoul it. The interior arrangement of a poultry house should

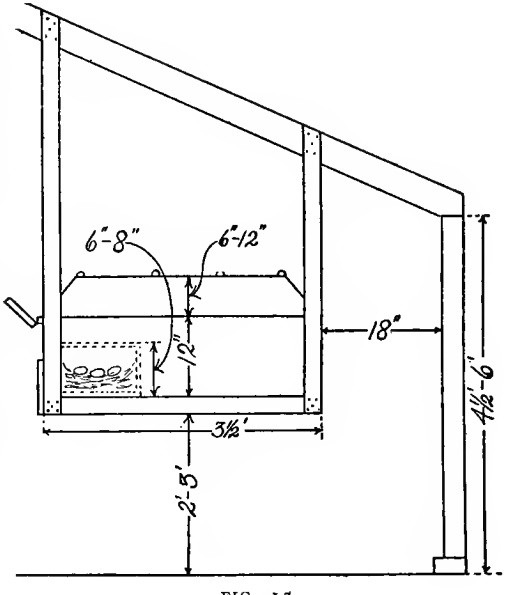


FIG. 15

not occupy the floor space; the hens need it all—and thus, also, the floors are more easily cleaned.

21. *Cleanliness is important; movable fixtures facilitate in cleaning the house.*—For the most part, interior fixtures should be portable to facilitate fighting mites (Figs. 14 and 15). Generally they should not be allowed to touch the sides of the house. If they do, the wall must be kept tight and vermin-proof. Roosts should be on the same level to prevent fowls from fighting to get to the highest place. They should be placed in the warmest spot, out of the reach of drafts, and as high as possible without injury to the fowls in descending. They should be so close that fowls can snuggle together and keep each other warm, and enough space should be provided so that they can separate during warm weather. Allow from six to twelve inches for each fowl. The form of perch most desired seems to be a piece about two by three inches, with the narrow edge rounded. Under the perches should be a platform to catch the droppings—far enough below to permit cleaning without removing perches.

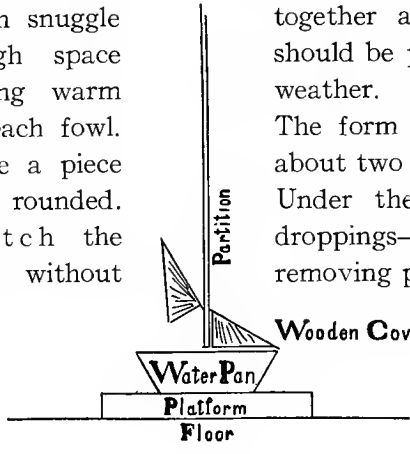


FIG. 16

22. *Hens are secretive and prefer darkened nests.*—They like to hide their nests, therefore these should be partly dark; they are less apt to eat eggs in dark nests. A good place for the nests is under the droppings board. They should be so placed that the eggs can be gathered without stooping. Hens like to fly up to lay. Nest boxes should generally be about one foot square and from six to eight inches deep, so that the nest material will prevent the eggs from breaking, and the hens cannot roll eggs from one nest to another. The partitions between nests should permit hens to go from one nest to another, otherwise they will fight and break eggs. Fine hay is the best nest material; sawdust stains eggs; excelsior wads up and sticks to hens' toes; straw is too coarse. Provide nest eggs; the hen then feels a sense of security. That is why different hens like to lay in the same nest. Figures 14 and 15 are suggestions for roosting and nesting arrangements which we have been using with great satisfaction; they can be modified to suit conditions.

Water basins should be large enough so that when filled the water

will last for twenty-four hours; then we shall know that the hen will never suffer from lack of water. They should be easily cleaned, and should be made of such material that they will not break if dropped or frozen. The best water-dish is a galvanized iron refrigerator pan, with corrugated bottom and with top larger than bottom. It should be placed a little above the floor, with a cover to prevent its becoming dirty (Fig. 16).

A self-feed grit-box should be placed where the hens can have constant access to it and cannot roost upon it (Fig. 17). Every pen should be provided with a hanging coop, with slat sides and bottom, in which to place broody hens or extra males (Fig. 18).

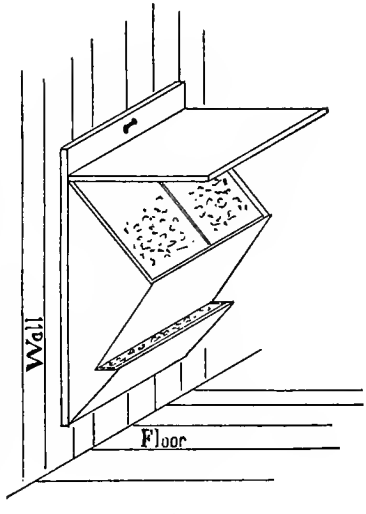


FIG. 17

In the foregoing pages the attempt has been made to take up the parts of a poultry plant in detail, to discuss the principles involved, and to give the reasons why, leaving to each one who reads it the problem of applying the principles by locating and building according to his own conditions. There is no one best poultry house for all, but there is a best poultry house for each one. We will give in the following pages illustrations and descriptions of practical poultry houses of several different designs.

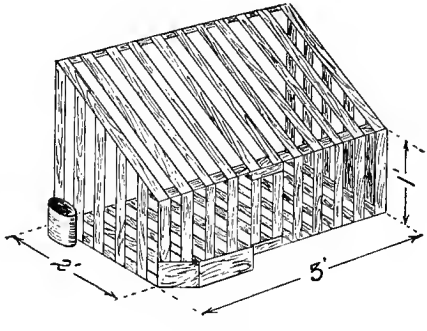


FIG. 18

Poultry House Suggestions

Poultry houses are discussed in "Farmers' Bulletin No. 141," United States Department of Agriculture, as follows: "It is very desirable that poultry should be provided with a house somewhat separated from the other farm buildings, but near enough to the barnyard so that they can spend a part of their time in scratching for and gathering up the many seeds and grains which otherwise would not be utilized. On farms where no poultry house is provided the hens are compelled to seek roosting places wherever they can find them — sometimes in fruit trees, sometimes on feed racks, sometimes on the farm machinery, and sometimes even on the wagons and carriages.

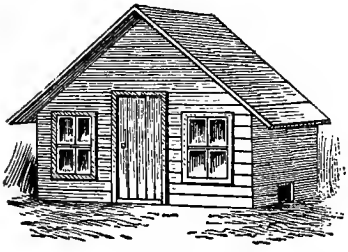


FIG. 1. IMPLEMENT HOUSE TRANSFORMED INTO POULTRY HOUSE

"Poultry houses need not be elaborate in their fittings nor expensive in construction. There are certain conditions, however, which should be insisted upon in all cases. In the first place, the house should be located upon soil which is well drained and dry. A gravelly knoll is best, but, failing this, the site should be raised by the use of the plow and scraper until there is a gentle slope in all directions sufficient to prevent any standing water even at the wettest times. A few inches of sand or gravel on the surface will be very useful in preventing the formation of mud. If the house is sheltered from the north and northwest winds by a group of evergreens, this will be a decided advantage in the colder parts of the country.

"Sometimes there is already a small building on the farm which has been used for implements or animals and which is no longer required for these purposes. Such a building may be easily fitted for poultry by cutting a small door in one side and placing roosts and nests in the interior. (Figs. 1 and 2.)

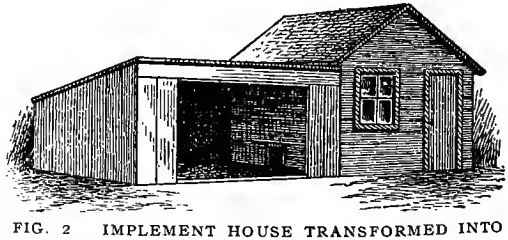


FIG. 2 IMPLEMENT HOUSE TRANSFORMED INTO POULTRY HOUSES

"In case there is no building suitable for remodeling into a poultry

house, an inexpensive lean-to may be built (Fig. 3), or a new building constructed. A house for this purpose should be planned with a view to simplicity, economy and convenience while supplying the conditions proper for successful poultry keeping.

FIG. 3. A LEAN-TO POULTRY HOUSE

"One of the simplest forms of poultry house is shown in Figure 4, and ground plan of the same in Figure 5. A scratching-shed may be attached to the side of this house, as in Figures 6 and 7, which, if desired, may be inclosed in front with poultry wire, so as to keep the birds confined.

"The details of construction of roosts are seen in Figure 8. The important points are a nearly flat or slightly rounded surface on the upper side and as few cracks and crevices as possible in which vermin may hide. The roosts may be made of two- by three-inch scantling, and should be so put in that they can easily be removed at any time for cleaning and disinfection. A platform is often placed under the roosts to catch the droppings, and the nests are placed under this platform.

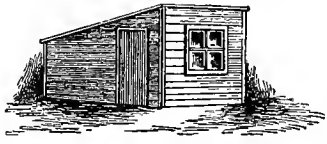


FIG. 4. SIMPLE FORM OF POULTRY HOUSE

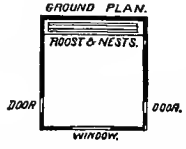


FIG. 5. GROUND PLAN FOR FIG. 4

"The simplest form of nest is a box placed upon the floor of the poultry house. With heavy fowls, which are apt to break their eggs in fighting away other hens that try to enter their nests when they are laying and thus acquire the habit of egg-eating, a more concealed or dark nest may be necessary.

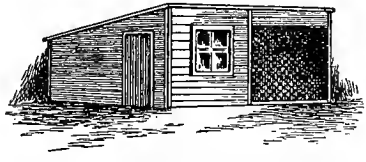


FIG. 6. POULTRY HOUSE WITH SCRATCHING SHED

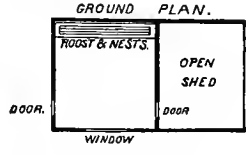


FIG. 7. GROUND PLAN FOR FIG. 6

"One of the most troublesome parts of a poultry house to make satisfactory is the floor. Many use earth floors, but these are often damp, especially in cool weather, and then induce rheumatism, colds, roup, digestive disorders and various other diseases. Some have put in cement floors,

but have found these cold and also more or less damp. Probably a good cement floor, laid on broken stone and covered with a few inches of earth, would be satisfactory, if not too expensive. A board floor, six or eight inches above the earth, with good ventilation under it, is dry but too cold, except in the South. A double flooring, laid tightly with building paper between, or a good single flooring covered with a few inches of dry earth, is probably the best. In all cases of board floors there should be sufficient space beneath for ventilation and to guard against the lodgment of rats.

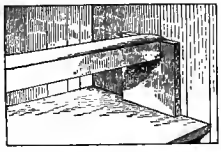


FIG. 8. CONSTRUCTION OF ROOSTS

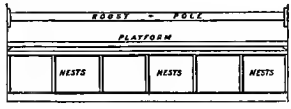


FIG. 9. SECTIONAL VIEW OF ROOST, PLATFORM AND NESTS

"A good style of poultry house, with scratching-room under it, is shown in Figure 10. In case more than one flock is to be kept, the plan may be multiplied to any extent by adding to the ends. With such houses there may be fenced runs at the back or front, or on both sides, so that the birds may be confined.

"The amount of space to be allowed for each bird depends upon the size of the birds, whether a shed is attached to the house or whether the fowls have a free run of the open fields. For birds in confinement there should be from six to fifteen square feet for each adult bird in case there is no shed attached to the house; and with a shed this space may be reduced about one-half. The yards should be large enough to allow exercise in the open air and to furnish more grass than the birds will eat. This will vary from 60 to 150 square feet per adult bird. The open shed facing the south, where the birds can be induced to hunt for their food and take exercise in all seasons of the year, and where they can enjoy the pleasure

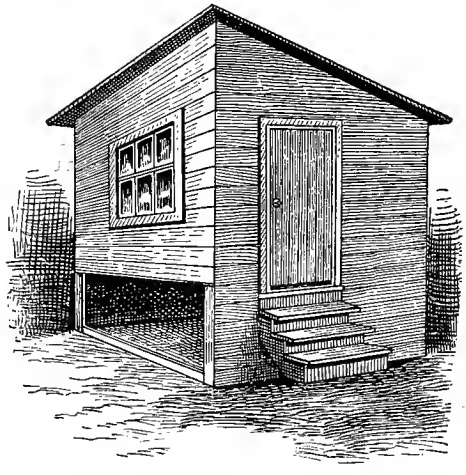
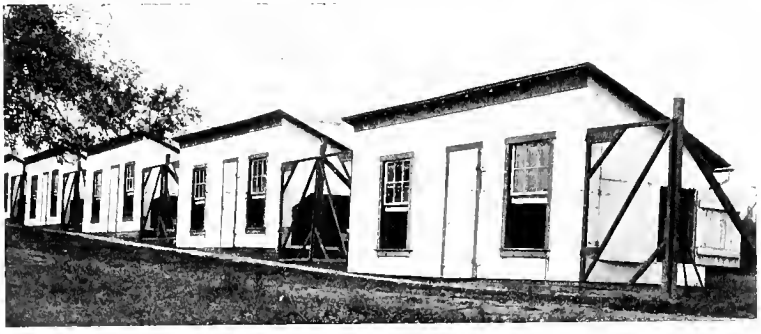


FIG. 10. SCRATCHING-ROOM UNDER POULTRY HOUSE

of scratching and dusting themselves in the sunshine, even during the winter months, is of great assistance in maintaining the health and productiveness of the flock. The roosting space allowed should be from six to eight inches for the smaller breeds, from eight to ten inches for the medium breeds, and from ten to twelve inches for the larger breeds.

"Poultry houses should be well ventilated, but so arranged that drafts of air will not strike the birds. Windows and doors should be provided in such locations that the sun may shine into the building a considerable part of the day. Sunshine is required both to keep the houses dry and to destroy various forms of infection."

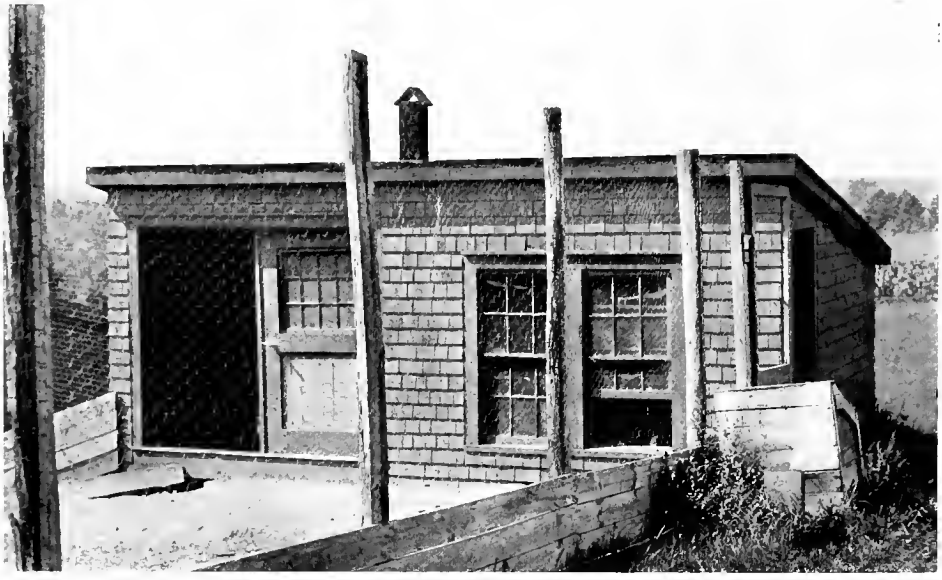


COLONY HOUSES AT THE WEST VIRGINIA EXPERIMENT STATION

Experiment Station Colony Houses

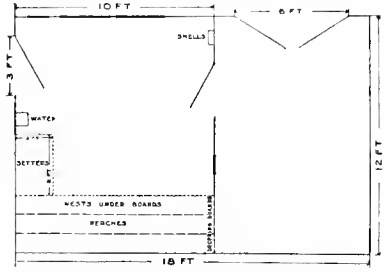
The West Virginia Experiment Station colony houses are ten feet wide and twenty feet long, and are arranged in a row facing southward so as to give the fowls as much sunlight as possible during the winter. In front of each house is a door and two windows. The doors are furnished with spring locks, thus securely fastening the houses at all times. The windows are covered with wire netting and are kept open during the hot weather. These and a drop door on the east end of each house, also covered with wire netting, are the only means of ventilation. At the approach of very cold weather the windows and doors are closed and remain so until spring.

There are two runs for each house, and they are entered by the fowls through two drop doors in the rear of the houses. An advantage of having double runs is that the fowls are thus constantly supplied during



SCRATCHING-SHED HOUSE AT THE MASSACHUSETTS EXPERIMENT STATION

the summer with an abundance of green food, the runs being plowed three or four times, and alternately planted to rape or some other suitable crop. During the planting, and while the crop is young, the adjacent run is opened and the fowls have free access to it, while the newly planted yard is closed by means of a little drop door. Each run is furnished with a wire gate opening out upon a boardwalk which extends in front of the houses and runs.



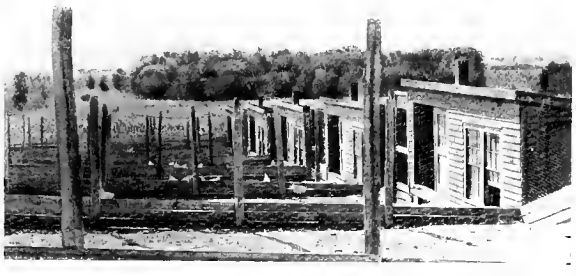
GROUND PLAN OF SCRATCHING-SHED HOUSES, MASSACHUSETTS EXPERIMENT STATION

The houses rest upon brick foundations about two feet in height, a foot of which is aboveground. The surface of the ground within this wall is filled up to the sills with sand, and upon this is scattered litter in which the fowls scratch during the winter for grain and grit.

A tile drain extending along the rear of the houses keeps the dirt floors of the houses dry in all kinds of weather.

The houses are divided into two rooms, a roosting room, in which the roosts and nest boxes are situated, and a scratching pen. The perches

are merely frames made from two-inch strips, suspended from the rafters by wires. Under the perches are the platforms for the droppings, which are also suspended from the rafters. Underneath these platforms are the nests. The accompanying cut shows the general arrangement and appearance of the houses.



HOUSES AND YARDS, MASSACHUSETTS EXPERIMENT STATION

We show an illustration of the colony poultry house with scratching-shed which is used at the Hatch Experiment Station, Amherst, Massachusetts. These houses are 12 x 18 feet, having a scratching-shed 8 x 12 feet and a roost- and nesting-room 10 x 12 feet. There are two full-sized windows made to open up and down in the roosting department, while the scratching-shed is provided with double doors which open nearly its entire front. These houses are very substantially built, are nine feet high in front and six feet high in the rear. The walls and roof are shingled. The doors to the scratching-shed each contain a twelve-light window in the upper half. These doors are made to open inward, as shown in the illustration. The houses have earth floors, which are perfectly dry, as the buildings are located on well-drained land. Each house is provided with a yard, as shown in the illustration.

SCRATCHING-SHED HOUSES AT THE CONNECTICUT EXPERIMENT STATION

The colony houses of the Connecticut Experiment Station are cheaply built scratching-shed houses, sixteen feet long and five feet nine inches wide, six feet high in front and four feet high in the rear, a little less than one-half of which is made as a roosting-room and the balance a curtained-front shed. The front of the roosting-

room has a two-foot-wide door and one double-sash window. The curtain of the scratching-shed is stretched upon a light frame, which is hinged at the top, and may be raised or lowered by a cord which passes through the outside front of the shed. The scratching-shed has an earth floor and a board floor is provided for the roosting-room. Each of these colony houses has a yard sufficiently large so that there is good grass in them for the fowls all summer long.

Practical Colony Houses

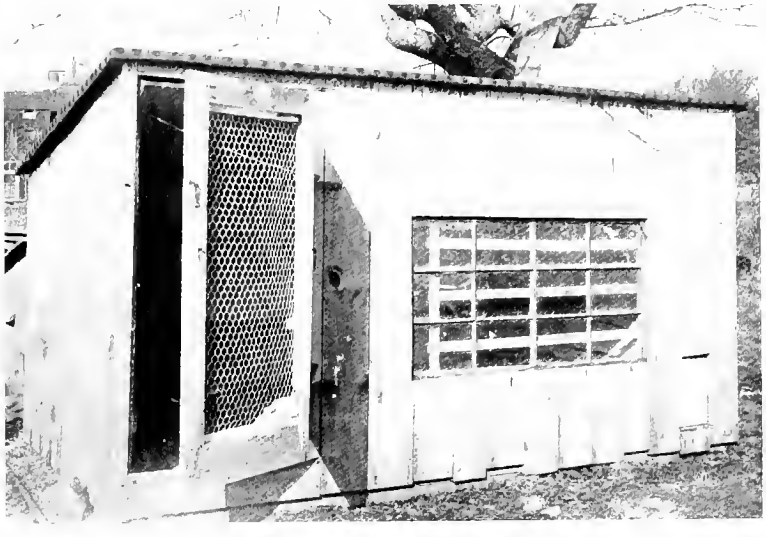
A colony house suitable for growing stock, a breeding-pen or a brooder house was described by Arthur G. Duston, a practical poultryman of Massachusetts, in the *Reliable Poultry Journal* as follows: "I have been in the poultry business for many years, and have seen and tried many houses, but I have never seen the equal of the house shown in the accompanying illustration. This house is ten feet in length and five feet in width. The height in front is five feet three and a half inches and in the back is four feet two inches. A large double window furnishes light. It is placed low in the house, as you will see, being but one foot from the board floor. When the door is open the sun shines in as though it were an open shed. The door is 2 1-2 x 4 1-2 feet and is made in two sections. The inner section is hinged to the outer, thus making a door within a door. The opening in the door proper is covered with one-inch-mesh wire netting. This permits of the opening of the panel door. Throughout the winter, except in stormy weather, this outside door is left open all day. When closed the building is tight and warm. The first year there is no need of papering the sides, but after that the openings from shrinkage make drafts, which, of course, the birds cannot stand. The roof is covered with any good roofing fabric.

"This convenient colony house is durably built of 2 x 3 studding and seven-eighths-inch matched stock. About 68 feet of studding and 230 feet of boards are required. The house is built on two pieces of 2 x 4-inch stuff, rounded at the ends. I can take my work horse and haul one of these houses all over the farm. I can hang three- or four-foot wire netting on stakes driven in the ground and in a few minutes have a house and yard ready for occupancy. I have kept breeding-pens in buildings of this type with splendid success and have housed sale cockerels in them until late in spring. What better can be found than a house of this size for

AUSTRALIAN-BRED MALAY COCKEREL

service in the spring, with either chicks just hatched or with growing stock? With a bran sack I divide the house into two pens and into each put hens with chickens. They do splendidly; if the mothers are shut in small coops formed by placing a board across each back corner, the chicks have the range of the whole floor.

"A brooder may be put into this house in early spring when the weather is too changeable to allow the use of any brooder out-of-doors. When a brooder is in a house like this your chickens have practically outdoor



MR. DUSTON'S COLONY HOUSE

exercise when they could hardly run out on the ground. Last spring I placed a brooder in this house and cut a hole in the end of the house for a lamp. This brooder gave entire satisfaction. The large window, and the door always open, furnished an abundance of sunlight and air, which had much to do with the success of the brooder.

"The general usefulness of the house is what has appealed to me most. Last season I had several of these houses for summer quarters for yearling hens distributed through the fields. The hens so housed have molted better than any I have ever had before. The doors are not shut at all at night, and the hens have been free from every malady. I have twenty of these houses and intend to build more. If one can do the work oneself, one can build such a house

for $9.61 This estimate does not include the cost of paper for covering roof and sides.

"There are many uses for such a house on any poultry farm. It cannot be bettered as a summer shelter for growing stock. If one has but little room he can haul this house eack week to a fresh plot of grass, as he would do with a small brooder, thus allowing the grass on the old place to grow again. The brooder, however, cannot be compared with this colony house when the chickens have reached some size."

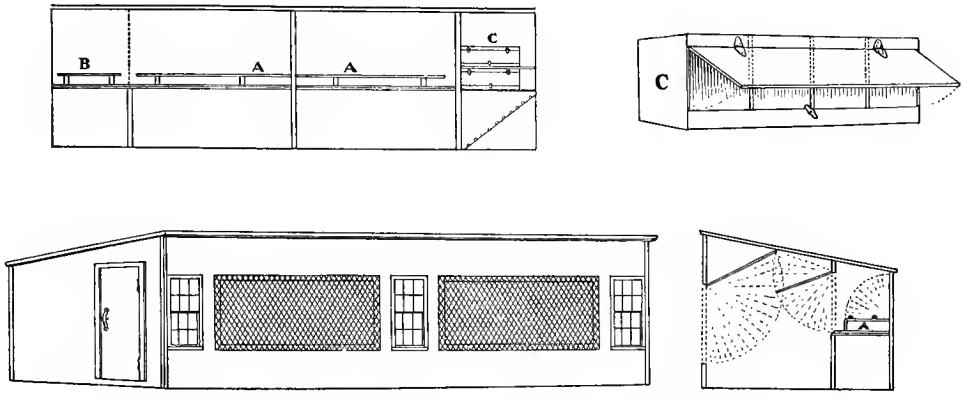
A Curtained-front Poultry House

At the Maine Experiment Station fresh air was the main consideration in their new poultry house. Its chief peculiarity was a curtained-front roosting-room and a curtained front to the house proper. The developing of a new idea in poultry-house construction, and the test proving it a most practical one, certainly justifies a feeling of satisfaction, and this success has come to Professor Gowell at the Maine Experiment Station. Although the experiment was tried with great misgiving, the success was beyond question, and when the fifty birds not only continued in high health but contributed a steady supply of eggs throughout the winter, it would seem as though the conditions were substantially right. The chief point of this poultry house is that only two cloth curtains are between the birds and all outdoors at night, and it's cold weather up in Maine, the mercury oftentimes going away below zero. A remarkable feature of this house is that the birds were tight-shut within the small roosting-pen on decidedly cold nights, with only about four cubic feet of air space for each bird.

A point that we want to keep in mind is that the Maine Experiment Station is in a very cold country, being located some ten or a dozen miles north of Bangor and almost up to latitude 45. When we see that Ottawa, Ontario, is only 45 1-2 north, that Minneapolis, Minnesota, and Portland, Oregon, are 45 plus; Chicago 42 minus; Cleveland, Ohio, 41 plus, and Buffalo, New York, 43 minus, we realize that a poultry house which does good work at the Maine Station will do equally good work anywhere in the northern States and the more thickly settled portions of Canada.

The house is twenty-five feet long by ten feet wide, and as the roost platform is three feet above the floor the whole of the 250 square feet of floor space is available for exercise room: five square feet of floor space for each of fifty birds.

A decidedly important factor in this curtained-front house is that straw to the depth of six or eight inches was over all the floor, and some kernels of grain were thrown in the straw overnight, so that the birds went



THE CURTAINED-FRONT HOUSE AT THE MAINE EXPERIMENT STATION

immediately to scratching (exercising) as soon as they came off the roost in the morning. It would be unwise to open the curtain of the roosting-pen and let the birds out into the very cold atmosphere of the house without their having an inducement to work; the air within the close-shut roosting-pen would be warm (comparatively), and that of the house very cold, with only a muslin curtain between the inside air and the below-zero air outside. The air inside would be down toward zero some mornings, and far below freezing many mornings, and yet by that simple precaution of having them go immediately to work kicking the straw about, the warm, snug air of the roosting-pen and the sudden change to the cold air of the scratching-room induced no colds nor any troubles of a similar character. We would build such a house with a shed roof, the front seven feet high and the back five and one-half feet high. In describing this house Professor Gowell says:

"The roost platform is three feet above the floor and is three feet two inches wide (clear). This width gives sufficient room so the back wall and front curtain are not soiled by the discharges from the birds while on the roosts. I do not like to have the platform nearer the floor than three feet. If the space is three feet high it is light and clear and is really a part of the room; if but two feet high it is only a hole into which the hens can go, to be sure—and a man has to crawl in search of the eggs

sometimes laid there. It is dark, and you have to make excuses (?) to yourself about it every time you go into it. Don't make it less than three feet for me! The roosting-room is three feet two inches wide in the clear (from wall to curtain), and averages three feet high from the platform below the roosts to the roof above. The house is clean, light, plain and inexpensive, and with so much open front it gives room for a large number of birds on small floor space.

"The walls and roof about the roosting-room must be double, must be tight and well packed, and the curtain must fit very close to prevent currents of air. Don't put in any ventilators! When the curtains are first shut down, on the first cold night, they are not allowed open another night until cold, freezing nights are over, unless we have a long winter thaw, in which case we use our judgment about leaving curtain open."

The curtain for front of roosting-pen is 3 x 16½ feet, and there is a "broody" coop (in which to imprison broody birds) at the left end four feet long. It is essential that the broody birds have a similar closed roosting-room as those not imprisoned, hence the curtain front of broody pen should be opened and closed, same as the other. For convenience make the front of roosting-pen in two curtains of 3 x 8 1-4 feet, setting a stud in center of front. For the front of the house have two curtains each four feet wide by eight feet long, which gives 4 x 16 feet of curtains, and three windows as shown.

All of these curtains should be tacked to well-made frames of 1 x 3-inch, hinged at top so as to swing up to the roof rafters, where hooks and screw-eyes secure them, and there should be a cross-brace to stiffen the frame. The front curtain, which is exposed to the weather, should be of oiled muslin such as gardeners use for covers for their coldframes; the curtains for front of roosting-pen and broody pen are of a good quality of muslin. The curtains should fit tight to prevent currents of air. The roost platform is made of two thicknesses of inch boards put together so as to break joints, the upper thickness being an inch within the lower, and the curtain frame shutting down close against it. The door to house should be in the west end, sufficiently far front to clear the broody pen curtain; as the front curtain does not come to the end of the house, the door will clear that. The three windows are of twelve lights each, 8 x 10 glass, and in winter for very cold latitudes have an outside ("storm") window on each, the chief advantage of it being to prevent the windows frosting

over. As that size of outside windows costs but about $1.25 each, they soon pay for themselves.

There should be a double wall, tightly packed with straw or swale hay, back of roosting- and broody pen and up the roof to front of same; in other words, the roosting- and broody pens are double-walled throughout. Covering roof and walls with a good quality of prepared roofing, such as Flintkote, Rubberoid, Neponset, Swan's Felt, etc., the outer wall would be wind- and frost-proof. To make inner wall about roosting-pen air-tight, put tarred sheathing paper upon inside of studding before boarding up. The roost platform is continued to the east end, making a nest-box platform four feet long. The nest boxes I would make three feet long by fifteen inches wide and high, five inches at the back closed up to enclose nest material; the front is closed by a door which is secured by a simple button and can be opened for collecting the eggs. To facilitate the fowls reaching the platform an inclined stairway could be put in leading up to an opening at the rear. The nest-box flats are partitioned into four apartments each.

The house used at the Maine Station had a board floor, with two or three inches of dry earth on it. I would prefer an earth (fine sand) floor, and to get absolute dryness would build houses with sills eighteen inches above ground-level, filling up inside to base of sills and sloping up the ground outside to same point. The slope outside would turn away the water and insure inside ground being bone-dry, for absolute dryness is essential to the best health of the flocks. Many poultry houses are damp and unhealthy because they are tight-shut, and the moisture condensed from the breath of the birds cannot escape; it collects on the ceiling and walls (in the shape of frost if the weather is cold) and drips upon the fowls and scratching material below. This curtained-front house would be wholly free from that trouble, and a part of the secret of the excellent results with it is that there is "ventilation" every day, and ventilation without drafts. Fresh air and a reasonable amount of exercise are a necessity if we would have good health and egg-production, and those qualities are combined most excellently in this curtained-front house.

Successful and Practical House

Writing of the "New Idea" laying- and breeding-house, Doctor C. Bricault, of Massachusetts, says. "We are firm believers in fresh air for our hens. We have had ample opportunity to note its good effects upon

DR. BRICAULT'S "NEW IDEA" POULTRY HOUSE

the health of the stock and the egg yield. The open scratching-shed gives us fresh air but not enough comfort, and it takes up too much space. It was in thinking about these things that we planned the house illustrated here.

"The large doors in the south front were the solution of the problem. With correct handling, the doors allow us to give our hens all the fresh air necessary, and still we are able to close them at night during the extremely cold weather and give them a comfortable place to roost in. During mild weather the upper part of the door is left open at night and a cloth curtain put in the opening, as can be seen in the illustration. When the sun is well up in winter the door is open and the whole floor is flooded with sunshine. How the hens appreciate this can be best understood by noting their contented appearance as they stretch out to sun themselves. The size of each pen is 10 x 12 feet, which will easily accommodate fifteen females and one male for breeding, or twenty-five females for laying.

"The frame is 2 x 4 for sills, plates and rafters and 2 x 3 for studding. It is five feet high in rear and seven feet in front. The sills are laid on cedar posts about one foot from ground-level. We take a six-foot post, cut it in two, and set it two feet into the ground. It is boarded up with cheap hemlock boards, first by imbedding the bottom board four inches into the ground, and having the bottom board come up to half the thickness of sill. Then the upper boarding begins at this point on the sill. This makes a tight joint near the floor and prevents cold drafts striking the hens and producing colds. The house is filled inside to level of sills

with gravelly sand, which makes a dry floor. To make the house tight along the upper part of the back wall, the rafters are cut even with plates and boarded up even with top of rafters.

"The boards are covered with a cheap building paper, then with sheathing quilt, and over these a prepared roofing. The roofing paper is held in place with tin caps and nails. In laying the paper we begin at the back, laying it up and down and lapping it well on the roof boards. This makes a perfectly tight joint just where the roosts are placed. The paper is then laid on all four walls, but the roof paper is laid lengthwise of the building. After the paper is laid on the back wall, we lay a course of shingles projecting from the house about five inches and another on top of this one. This we do in order to allow the roof water to be carried away from the building. Right over these shingles, but leaving about five inches of them to the weather, we begin to lay the roof paper.

"The south front contains a large door in the middle of each pen, with a window on each side of it. This door is 4 1-2 x 6 1-2 feet; it is divided into two parts; the upper part, which is 2 1-2 x 4 1-2, is hinged to the plate, swings upward against the rafters, and is held in place by two hooks. On stormy days or at night in mild weather this part of the door is left open and a cloth curtain placed in the opening. The lower part of the door is hinged at the side, and swings. The cloth curtain is a two-inch frame on which oiled muslin is tacked. The windows are ordinary two-sash twelve-light windows, and can be opened up and down at will. When the weather is settled we leave both windows and door open

FRONT OF HOUSE, SHOWING MOVABLE GATES DOWN

all the time; the house is then practically an open shed, and the most comfortable place possible for the hens in summer. A small opening about a foot square allows the hens access to the yard when the lower part of the door is closed.

"The divisions between pens are made solid, except the doors, which are two-inch wire netting nailed to four-inch frames. A good-fitting door is our hobby, and ours fit well; they are hung on double-spring hinges, and work perfectly both ways. Going through the pens with a pail in

SHOWING ARRANGEMENT OF ROOSTS AND NESTS IN "NEW IDEA" HOUSE

each hand, it is no trouble to push the doors with the foot going or coming, and we economize the room which the passageway would occupy. Along the back wall, eighteen inches from the floor, is placed the droppings board, and six inches above this two roosts, which are 2 x 3, with corners rounded off and laid on the two-inch side. Sixteen inches above there is a row of coops the length of the pen. These coops we use for spare males, broody hens, or for a trio preparatory to shipping. Under the droppings board are the trap nests. In the division between pens are the drinking vessels, raised ten inches from the floor. These are made of galvanized iron and are fourteen inches in diameter and six inches deep."

MALAY COCK AND HENS.

An Excellent Canadian House

The poultry house of L. H. Baldwin, of Canada,* is well planned and has given good results. The point of excellence in it is that the fowls are allowed exercise in the open air and are at the same time protected from the wind. It also furnishes a warm roosting-pen.

It is a frame building seventy-two feet long and ten feet deep, and is divided into four scratching-sheds and four roosting-pens. The ground plan is shown in Figure 1. The sills are 4 x 4 cedar, resting on large stones. The studding is 2 x 4 hemlock. The top of the sill is one foot above the surface of the ground, and a base-board is fastened on the inside of the sill; the floor of the house is filled with sand to the top of the base-board, and the earth is banked up on the outside to the same level. The stones upon which the sills rest are placed at varying distances to meet the joists and at intervals of about eight feet. The north wall is four feet high from the top of the sill, and the south wall seven feet high. In the north wall the studding is placed at each corner of the roosting-pens and an additional one in each center, also at the corner of each scratching-shed, and an additional one in the center. In the south wall the studding is placed so as to accommodate the window. At the east end an extra stud stands as a doorpost, and one at the west end, in the center. The rafters are 2 x 4 hemlock, placed at two-feet centers. On the outside of the studding and rafters ordinary lumber is used, running the boards lengthwise. The ends of the building, the north wall and the south fronts of the roosting-pens are covered with a two-ply "ready roofing," and for the roof three-ply "ready roofing." A scantling 2 x 4 reaches from the north sill to the south sill at the base of each division. The division wall between the scratching-shed and the roosting-pen is made of rough lumber on the scratching-shed side, with a lining of tar felt nailed on the interior of these boards, and battened closely with laths to make the joints of the tar felt complete. The division wall between the roosting-pens is made of seven-eighths tongued-and-grooved flooring, and the other interior walls of the roosting-pens are lined with seven-eighths tongued-and-grooved dressed material. The ceiling is of the same. Before putting on this dressed material, a second layer of tar felt was placed between the sheathing and rafters, so that there is a dead-air space. The large doors between the

*Described in "Bulletin No. 127," Ontario Department of Agriculture.

scratching-sheds and the roosting-pens are about three inches thick, made of two thicknesses of seven-eighths tongued-and-grooved dressed material,

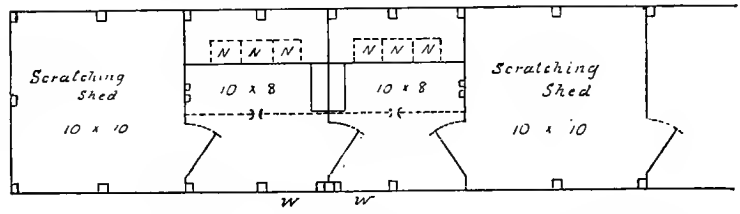


Fig. 1.

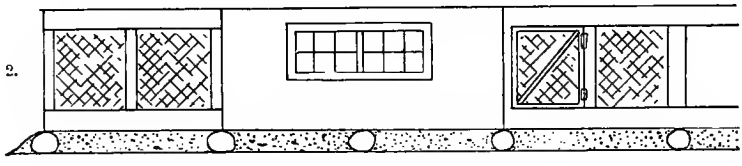


Fig. 2.

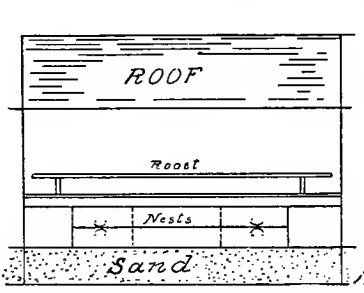


Fig. 3.

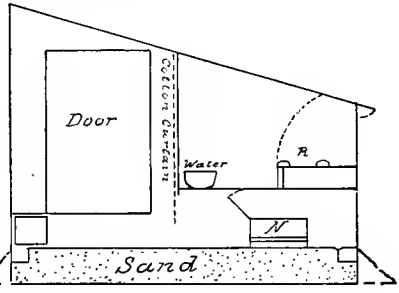


Fig. 4.

DETAILS OF MR. BALDWIN'S SCRATCHING-SHED HOUSE

with a space of one inch between, and lined with tar felt on the inside. These doors are raised a foot above the level of the sills, and in this space, near the south wall, is cut openings ten inches wide, furnished with sliding doors.

The droppings board is three feet wide and eighteen inches above the top of the sills. Two roosts, each 2 x 3, are placed on the flat side, fastened together by a cross strip which is hinged to the north wall. Two legs support the roosts on the outer side. The roosts being hinged, they can be lifted up and fastened to the roof so as to leave a clear space when making the daily cleaning. The roosts come short of each wall by about two inches. Three nests each eighteen inches square are allowed to each pen. Against the inside division, between the roosting-pens, a twelve-inch board extends on the level of the droppings board to within

twelve inches of the door, and an upright twelve-inch board is fastened to the end of this and runs up to the ceiling. To correspond with it, a board is placed against the opposite wall, and a cotton curtain on a two-inch roller is fastened to the ceiling. This curtain is shown by the dotted lines across pens in Figure 4. When this curtain is down it comes to about two inches below the level of the droppings board. The purpose is to protect the fowls on very cold nights. Mr. Baldwin has found that it is not necessary to use it when the pens contain more than fifteen birds; but if the number is reduced, and the thermometer drops to the neighborhood of zero, it is well to let it down.

The windows in front of the roosting-pens are each three feet wide and two feet six inches high, containing six panes 10 x 12 inches each. The windows are placed high in the front wall and slide to the right and left. The windows being placed high up, the sun in winter, when it is low in the heavens, shines upon the roost and droppings board. The door between the roosting-pens, which is also a foot above the level of the sills,

Photograph by Prof. W. G. Johnson.

AN ORCHARD RANGE ON THE POULTRY FARM OF WHITE AND RICE, NEW YORK

is of seven-eighths-inch stuff, the upper half being made of wire netting. The front of each scratching-shed is divided in two by the center studding, on each side of which there are cotton screens hinged at the top and reach-

ing down to within one foot of the top of the sill, and, when down, close upon the top of a rain-board which slopes to the outside, so that rain beating against the cotton screen is carried outside, thus keeping the interior dry. These screens swing up to the roof and are there caught by hooks from the rafters. The front of each scratching-shed is closed with two-inch mesh wire netting. (One-inch mesh should have been used to keep out the sparrows, which now get in and fly off with a lot of grain.) An eaves-trough runs the length of the building, distributing the water east and west. Drinking fountains are placed on the end of the board that runs out from the droppings board, and on the wall opposite hang the boxes for oyster shells and grit. The windows of the roosting-pens are open every day. Of course, when the weather is stormy or bitterly cold they are open only for from fifteen to thirty minutes in the middle of the day. When the sun is shining brightly they may be left open for some hours. This thoroughly ventilates the house, dries up all moisture, and keeps the place clean and sweet. The screen in front of the scratching-shed is let down only on very cold days and when the weather is cold and stormy, the idea being to keep the open shed dry where the birds take exercise in the open air.

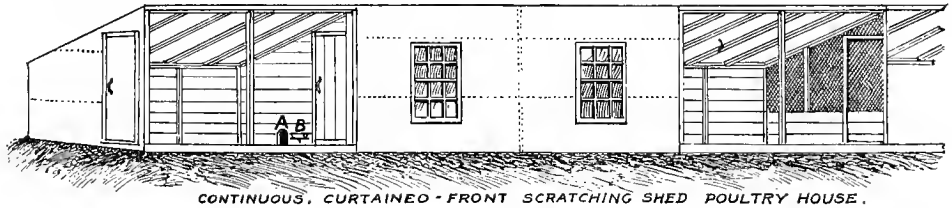
This method of housing poultry keeps the stock in the most vigorous health, and this is the secret of success in obtaining a plentiful supply of fertile eggs in winter.

The Scratching-shed House

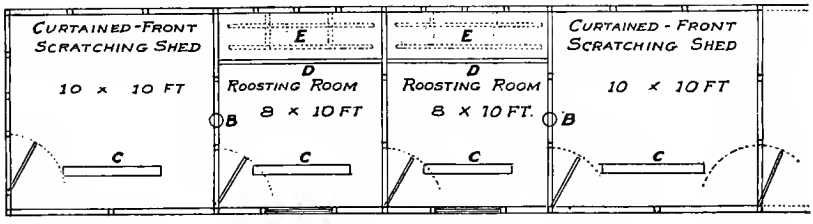
A practical poultry house with curtained-front scratching-shed was recently described by the writer as follows: We give herewith plans for a continuous poultry house with alternating pens and sheds, the sheds having curtained fronts and all the space within the house being utilized. Many years' study of poultry-house problems has convinced us that this alternating-shed-and-pen plan is the best, all things considered. No house plan is perfect; we have to balance advantages against disadvantages, and should choose the plan which combines the greatest number of advantages with fewest disadvantages, and so firmly are we convinced of the general excellence of this pen-and-shed plan that if we were erecting a poultry plant for 200 or 300 (or 2,000 or 3,000) head of fowls that is the plan we would use.

Each combined pen and shed is 18 x 10 feet, the curtained-front shed

being 10 x 10 and the closed roosting-pen being 8 x 10—room sufficient for twenty-five fowls of the American or thirty of the Mediterranean varieties; no walk is required because the walk is through gates and doors, from shed to pen and pen to shed, and so on to the end of the house and out the other end. We have seen this plan given with a roosting-pen at the end, then two sheds and two pens, etc. Don't do that! By bringing the closed roosting-pens together in pairs they contribute to each other's warmth, and every pen has the protection of the shed beyond; the end apartment should always be a shed. The ventilation (so much desired) is very varied, and can be adapted to the different seasons in half a dozen



CONTINUOUS, CURTAINED-FRONT SCRATCHING SHED POULTRY HOUSE.

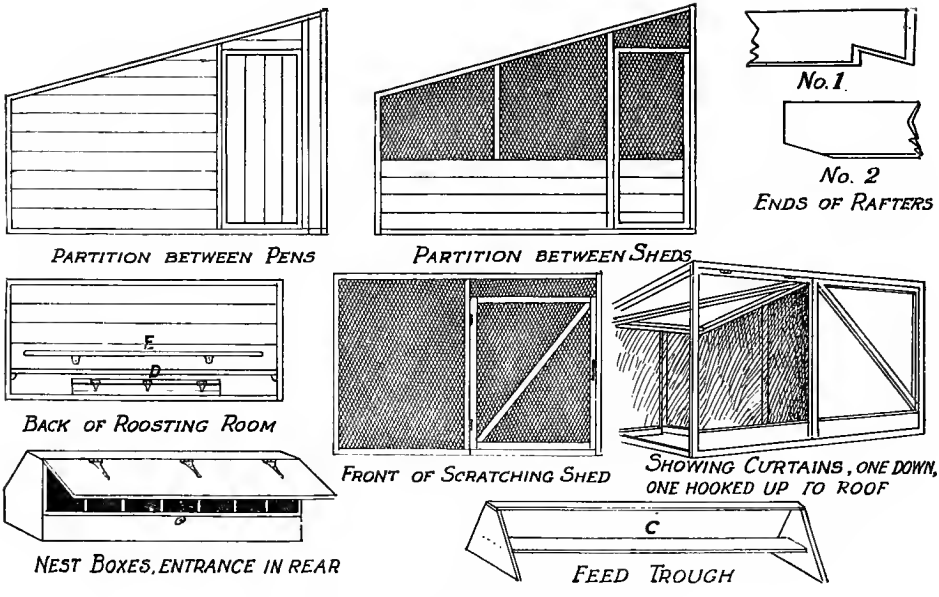


GROUND PLAN OF PENS AND SHEDS

THE CONTINUOUS SCRATCHING-SHED HOUSE

different ways. In summer the doors and windows are all wide open, excepting the door between two pens, and the curtains all hooked up against the roof out of the way

When the nights begin to be real frosty in the fall, close the windows in fronts of pens, but leave shed curtains hooked up and doors between sheds and pens open. When it begins to freeze at night, close the curtains in fronts of sheds, but still leave doors between pens and sheds open. These doors (including slide door A) are never closed excepting on nights of solid cold, say from five to twenty degrees above zero; and for zero nights (five degrees above to away below) close the curtains in front of roosts, and all doors and windows should be closed. An additional pro-



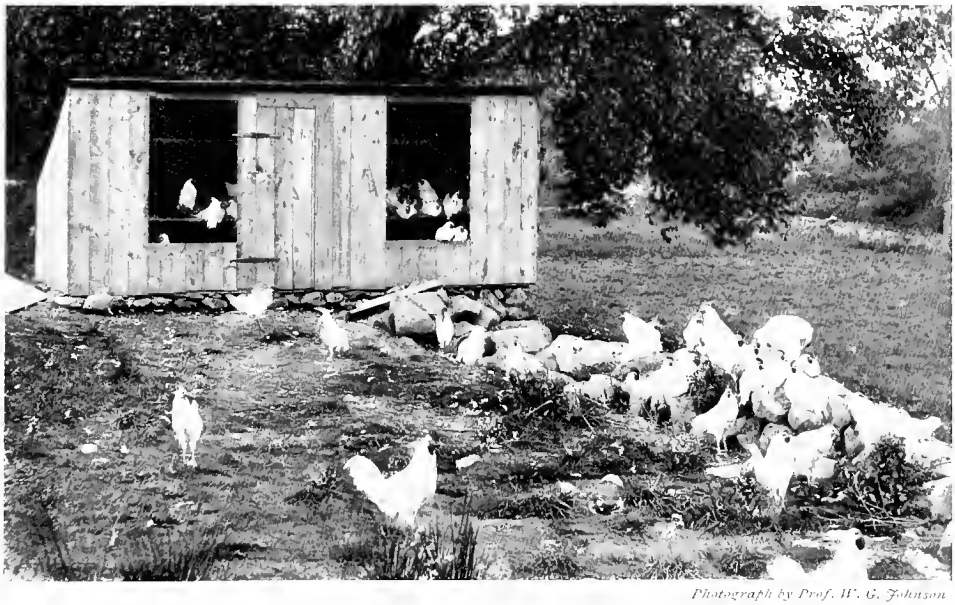
DETAILS OF SCRATCHING-SHED HOUSE

tection against cold in extremely cold latitudes would be to double-wall the roosting-pen from the sill up to the plate and then four feet up the roof, packing the spaces with straw or swale hay (seaweed, where it can be had, as it is vermin proof); then have a hinged curtain to drop down to within six inches of front of roost platform, going a foot below it; this curtain we would close only on zero nights.

Sills and plates are all of 2 x 4 scantling, halved and nailed together at joints. The rafters, the corner studs and studs in centers of fronts of sheds are all 2 x 4; the intermediate studs are 2 x 3. Set the sills on stone foundation, or on posts set into the ground below the usual frost line, the posts being set five feet apart excepting in front of pens, where they would come four feet apart, there being a post at corners of each pen and shed and one between; the rafters should be two feet apart. The sills we would set a foot and a half above average ground-level; put hemlock (or some hard wood) boards from bottom half of sill down to ground, nailing it securely to sill and foundation posts, then fill up inside to bottom of sills and slope up the ground outside to same height. Toe-nail studs to sills firmly, plates to studs ditto, and rafters to plates. Make front studs seven feet (or at least six and a half feet) in the clear, and back studs

five feet (or four and a half feet) in the clear; of course, studs in front of pens will be set to take window-frames (or the window-sash, if no frames are used), and in partitions the studs will be set to take the two-and-a-half-feet-wide doors. All of this framing is simple, and any man who can saw off a board or joist reasonably square and drive nails can build such a house, the slight bevel at each end of rafters being quite as simple. All boarding is lengthwise, the boards being firmly nailed and close joints made everywhere. Cover the boarding, both roof and walls, with a good sheathing paper (or sheathing quilt) and then put on the outside a covering of some good roofing material.

The prepared roofings come with nails and tin-heads inside each roll, the price at which they are sold covering everything of that kind. As a general rule, these roofings should be applied lengthwise of roofs and walls, and where doors and windows are set in walls bring the covering material out over top of door or window-frames. A twelve-light window of 8 x 10 glass is set in front of each pen, and all doors and gates are two and a half feet wide by six feet high. Have plenty of hooks and screw-eyes to secure doors and gates back against the walls and curtains up against the roofs, each large curtain in front of shed needing two hooks



Photograph by Prof. W. G. Johnson

COLONY HOUSE AND OPEN RANGE ON POULTRY FARM OF WHITE AND RICE, NEW YORK

and screw-eyes, one at each lower corner, to prevent it from twisting. All windows should be protected by two-inch-mesh wire netting tacked to inside of frame to keep fowls from dashing against it if startled and keep varmints out when window is left open at night. To keep the fowls enclosed when curtains are raised, cover the front of shed with wire netting, having one section of it made as a gate to open and let the birds out into yards. This large gate will be found very convenient when bringing in coops of birds from the fields.

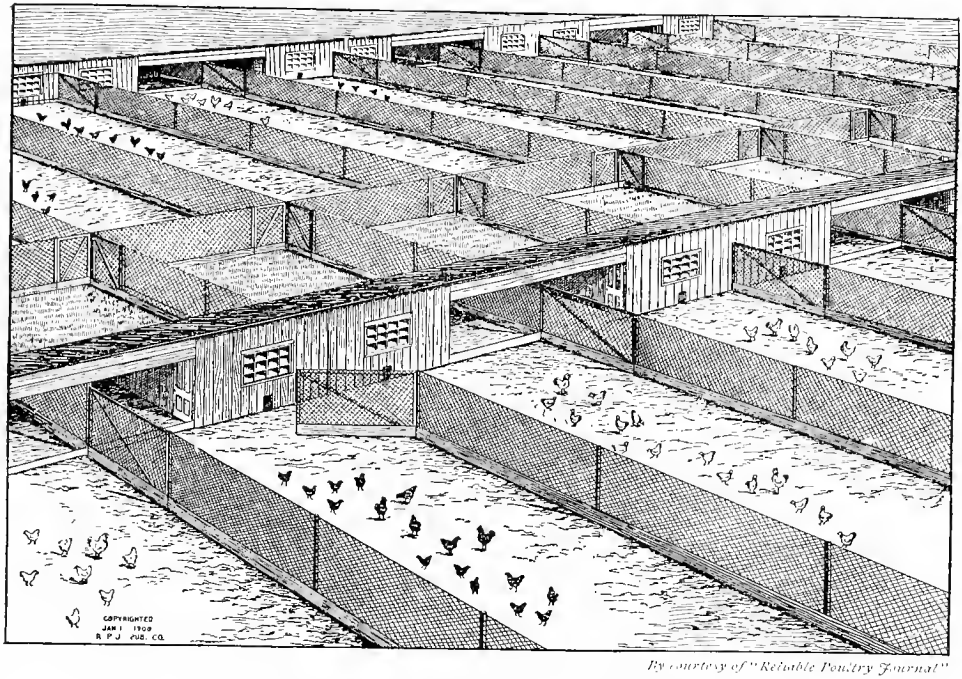
The frames for the curtains are made of good, sound 1 x 3-inch furring, halved and securely nailed at corners, and a brace set diagonally across back of frame to firm it. Care must be taken that gates between sheds do not come in conflict with these curtains when they are hooked up; as they are left up seven or eight months in the year and taken down nights and stormy days four or five months, care must be exercised to have the gates swing clear. The doors from sheds to pens swing into the pens and are out of the way of the curtains. Another point to be considered is carrying off the drip from the curtains in case of a driving rain from the south. As there is usually (in winter) six inches of scratching material in the sheds, the curtains should not come down to the sills, and a board eight or ten inches wide should be set slightly slanting in from the sill to just inside the bottom of the curtain frame; such drip-board secures the scratching material within the shed and conveys the drip outside the sill. The roost platform should be three feet wide and the full length of roosting-pen, excepting that it should be short enough to lift out easily for house-cleaning; strong cleats should be nailed to each end wall to support it, and the platform should be two feet above sill level.

Make the platform of matched boards, secured by two cleats across bottom, an "edge" of two-and-a-half-inch-wide furring being a decided improvement, keeping the droppings enclosed; for convenience, a space a foot in length can be cut out of middle of front edge through which to scrape the droppings. The two roosts are made of 2 x 3 scantlings, slightly rounded on top and cut eight inches shorter than platform, so ends of roost come four inches within the platform. Set roosts fourteen inches apart, which will bring them eight inches within the platform front and rear. Two cross-arms are hinged to wall at back eight inches above platform and terminate with legs eight inches long leading to platform; the roosts are swung up and hooked against the wall while cleaning off droppings.

From a drawing by Harrison Weir

CORNISH INDIAN PULLET

Describing the scratching-shed houses with double runs, the *Reliable Poultry Journal* says: "The laying houses with scratching-sheds, illustrated herewith, are used extensively on egg farms and by many breeders of exhibition stock throughout New England and the East. It will be noted in the illustration that these houses are provided with yards on both sides of the house. The short yards can be used for the fowls of either row of houses and as alternate runs, so that the regular yards can be

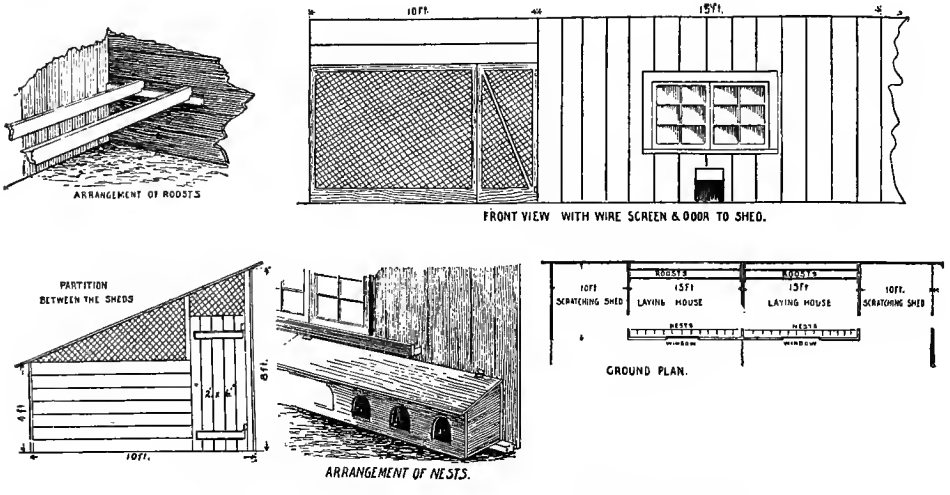


By courtesy of "Reliable Poultry Journal"

SCRATCHING-SHED HOUSES WITH DOUBLE RUNS

plowed up and planted to corn in order to purify the soil. This insures also a supply of green food for the stock birds throughout the year. We especially recommend this style of yarding. The dimensions of the houses and yards shown are as follows: The closed part of the house 10 x 15, scratching-shed 10 x 10; the main yards 25 x 75 feet and the short yards 25 x 25 feet. Each of these houses, with yards connected, will accommodate from ten to fifty fowls, depending on the object for which they are kept. If intended for breeding birds, flocks of from ten to fifteen birds will be large enough If the fowls are kept solely for the production of

market eggs, from thirty to fifty hens can be kept in each closed house and will do well. Green food, like rye, oats or blue grass, can be kept growing in these yards the entire season—the rye if planted in the fall will supply



DETAILS OF SCRATCHING-SHED HOUSES WITH DOUBLE RUNS

green food throughout the winter and in the early spring whenever the snow is off the ground. We recommend gates as shown in the cut—large gates next to the house, so that a wagon may be driven in, thus facilitating changing the litter and cleaning out the house.

"The windows of these houses should be comparatively small, say 2½ x 5 feet—that is, windows made of two six-light sashes, one sliding to the right and the other to the left. These half-sashes are inexpensive. A still better plan is to hinge them at the top so that they can be swung outward, thus keeping out the rain when open in the summer time. Prop them one-third open. It is a good plan to whitewash them with a view to keeping out a portion of the heat during hot weather; have them clear and clean in cold weather.

"In a majority of cases the houses of this style that exist in New England and the East are covered with roofing fabric held in place by wooden battens, but we recommend a shingled roof. For roofs having a steep pitch shingles will be found cheaper and more satisfactory in the end. Twelve-inch-wide boards will do for siding, and the house should be snugly lined with good building paper held in place by laths, or should

have double walls and the inside of the outside wall lined with building paper or tar felt. There is no danger whatever of making a poultry house too warm. On the other hand, it is unwise to go to unnecessary expense. Make sure that no draft can get in through cracks to strike the fowls when at roost, for this is certain to result in colds, which may end in roup. Do not worry about ventilators, provided the houses are kept reasonably clean. Plenty of fresh air will find its way in, especially during the winter, when it is most needed. No ordinary poultry house is likely to be built tight enough to keep out the necessary fresh air.

"The detail plan shows an enlarged front view of this plan of house with scratching-shed, giving dimensions. Any person who is handy with tools can by consulting these illustrations build a house of this style and equip a poultry plant on this plan.

"The sectional view shows the style of partition recommended for use

By courtesy of White and Rice *Photograph by Prof. W. G. Johnson*

GENERAL VIEW OF AN OPEN RANGE ON FERNWOOD FARM, WESTCHESTER COUNTY, NEW YORK

in dividing each closed section into two apartments and for use between the scratching-sheds. It is advised that these partitions in both locations be built up solid from four to six feet, so that there will be no fighting through

the wires by the birds either when on the roosts or in the scratching-sheds. Furthermore, this plan will make the houses and sheds warmer and will lessen the danger of drafts blowing over the fowls at night.

"The ground plan shows the laying house with scratching-shed attached, also location of roosts and nests. The detail shows arrangement of nests. These should be located on the ground underneath the windows. It will be understood that this plan can be added to or enlarged as desired. A single house with scratching-shed can be built, or a double house with two scratching-sheds and yards, or any number of the double houses, as shown in the illustration."

A LONG HOUSE AT THE WHITE LEGHORN POULTRY YARDS

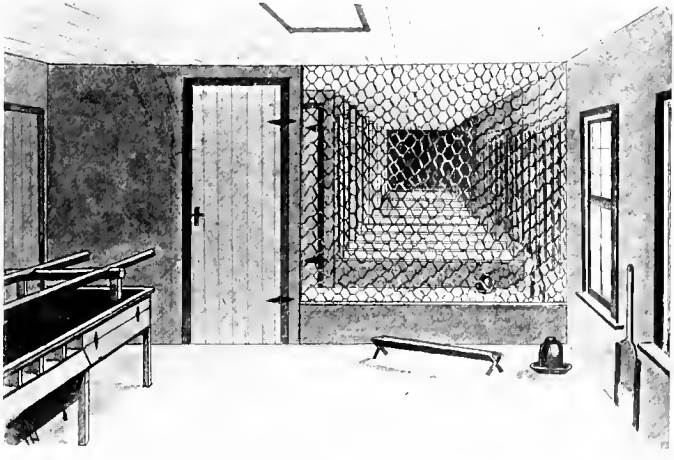
A Continuous Poultry House

The long, continuous poultry house is in use at the White Leghorn Poultry Yards of New York State, and was especially designed for housing White Leghorn breeders. It is 250 feet long by 16 feet wide. It has a floor of matched seven-eighths-inch boards. The outside walls are first boarded, then covered with sheathing paper and clapboarded. The inside of the building is boarded up with matched stuff on the inside of the studs, making a four-inch dead-air space between the walls. The ceilings are made of matched boards laid at the level of the plates. In this ceiling there is a trap-door two feet square over each pen, connecting with the attic chamber above.

In each gable end of the house there is a full-sized window, and, as shown in the illustration, there are three ventilating cupolas at regular intervals from the peak of the roof. In this way provision is made for proper ventilation of the pens without any direct drafts. If desired, straw can be placed in this attic, covering each of the trap-doors when open, and this will provide an effective means of getting rid of all moisture in the

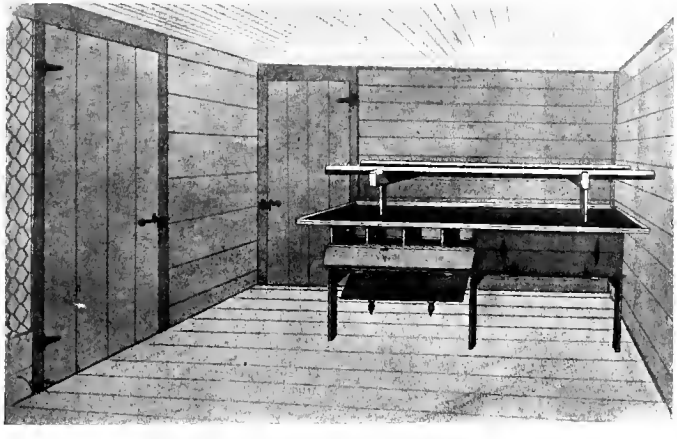
poultry house in the winter. On many poultry plants this system of using straw above the ceiling to afford diffusive ventilation is practised with great success.

There is a door at each end of the house opening into an alleyway which is three and a half feet wide and extends the entire length of the building on the north side. This passageway is separated from the pens by a tight matched board partition.



INTERIOR OF LONG HOUSE, SHOWING PARTITIONS BETWEEN PENS

The pens are twelve feet square, with two windows in the front (or south) side of each pen. A door opens from the alleyway into each pen, and there is a door in each partition between the pens. The roosting platforms and nests are placed as shown in the accompanying illustrations, which also show the construction of the partitions between the pens, the location of food-trough and water-dish, the windows, and the slide door which connects with the runs. A long house of this description, while somewhat expensive to build, possesses many advantages, and on a large, permanent poultry plant will more than make up for the first cost in the ease and economy of feeding, the



INTERIOR OF LONG HOUSE, LOOKING TOWARD THE WALK

warmth of the house, ease of caring for the fowls, and the simplicity of ventilation. If there is any tendency to drafts in the building, this can readily be controlled by using burlap curtains over the wire partitions between the pens. Burlap bran sacks cost about two and a half cents each and will cover about ten square feet.

This style of house has been in use on the White Leghorn farm for several years and has been found both practical and economical. It combines very completely the laying house with the breeding house. The 144 square feet of floor space in each pen affords ample accommodation for twenty-five laying fowls or from fifteen to twenty breeders and a male. On this plant, where the alternating system of handling males is practised, a small coop for the extra male is located on the wall in one corner of the pen. The male bird is confined in this coop for a few days while his partner runs with the birds, then the males are exchanged at night, the one which has been running with the flock being cooped up and the other set at liberty.

Hot-water Pipe Brooder House

Most large poultry farms make use of brooder houses in which to raise the chicks, the heat being supplied by a hot-water heater and conveyed to the brooder pens by a bank of hot-water pipes. We give illustrations of one of the best types of these brooder houses, by courtesy of the Lakewood Poultry Farm, of New Jersey. This brooder house is 110 feet long, six feet high at the back and five feet high in front, with a long and short

HOT-WATER PIPE BROODER HOUSE, LAKEWOOD POULTRY FARM

roof, the apex of the roof being over the partition between the walk and the hover pens. Ten feet of the house are occupied by the heater

pit, containing heater, chimney and coal-bin, and the 100 feet of brooder hovers is divided into twenty-three pens, each calculated for fifty chicks,

INTERIOR OF HOT-WATER PIPE BROODER HOUSE, SHOWING DETAIL OF PEN PARTITIONS, HOVERS, ETC.

making a capacity of more than 1,000 chicks in 100 feet of brooder house. The baby chicks need the highest temperature, hence are placed in the three-feet-wide pens nearest the heater.

These first five small pens are succeeded by five pens four feet wide by twelve feet long, and the balance of the house is divided into thirteen pens each five feet wide. A bank of two flow and four return pipes extends the entire length of the house, rising slightly from four inches above the floor next the heater to eight or ten inches above the floor at the farther end. The pipes are covered by "hovers," a covering of boards two feet wide and as long as the pen is wide, a strip of felting being tacked along the front and rear edges, this felting being slit into ribbons each about three inches wide.

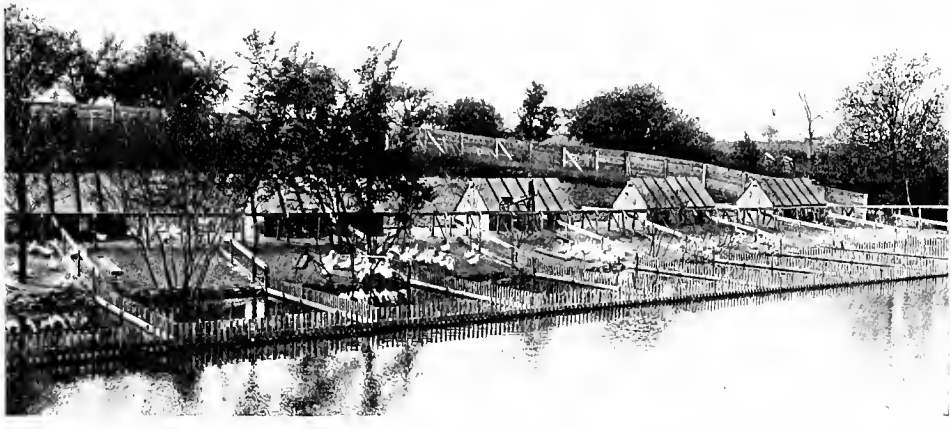
A few years ago these brooder houses were built with the hovers close up to the walk, and all feeding and watering was done in the pens in front of the hovers; the later method is to put the hovers out three feet from the walk partition, giving a space for feeding and watering next the walk. This plan has the further advantage of giving a better circu-

lation of air under the hovers, and should the temperature be a bit too warm for comfort under the hovers the chicks stretch their heads and necks (and frequently their whole bodies) out into the pens. By this plan, also, there is no possibility of a weak chick being crowded back into a corner and smothered; if crowded, he is simply pushed out from under the hover and runs back under it again at another place.

The illustrations well show the details of pen partitions, which are of boards for one and a half feet of the height and wire netting above; there is a slide door in each partition which is opened for driving the chicks through from one pen to another, and a small trap-door, operated by a cord leading back to the walk, opens into a small yard (or runway) out-of-doors. Two cleats about six inches out from the hovers secure a board for confining the chicks close to the hovers in very cold weather, and are useful to prevent the chicks hiding beneath the pipes when being driven through from pen to pen.

A half-window is set in the south front, at end of each pen, just above the trap-doors; these windows are hinged at top, and may be swung up

BROODER HOUSE HEATER, WITH WALK AT THE REAR



BREEDING-HOUSES FOR DUCKS, WITH HALF THE LENGTH OF YARDS IN WATER

against the rafters by cords operated from the walk. They should be screened by one-inch mesh wire netting to exclude chick enemies during warm weather, when it is well to leave the windows open (or partially open). A serious defect in hot-water-pipe brooders in the past has been lack of sufficient heat in extremely cold weather. To make the house abundantly warm there must be a heater of sufficient capacity for the maximum of cold; and to insure that the atmosphere of the whole house shall not fall too low a bank of pipes is put along the wall at the back (sometimes along the front beneath the windows), and these are operated in very cold weather to keep the temperature of the house at about 60 degrees. A shut-off valve disconnects these pipes when the weather has become mild and they are no longer needed.

Another decided improvement in brooder house construction is an electric regulator, which can be so attached to the draft-dampers of the heater as to open them if the temperature of the thermostat (set beneath one of the hovers) falls below the point desired to be maintained. With a brooder house properly equipped with hot-water heater and electric regulator the problem of raising chicks in winter is greatly simplified.

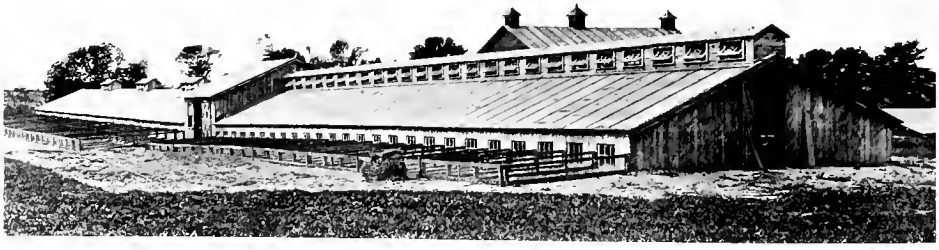
Houses for Ducks

Growing ducks for market has developed into a business of considerable magnitude, in some instances ten, fifteen or twenty thousand dollars being invested in the buildings of a single plant. Twenty, thirty,

forty or fifty thousand ducks, weighing about ten pounds to the pair, are marketed from some of these plants each year. On the eastern end of Long Island are grouped several great duck plants. While Long Island appears to be a favorable location for duck growing, there are many large duck plants located inland, one of the largest in America being in Massachusetts; while in Pennsylvania are other great duck ranches. In the latter State Messrs. McCormick and McFetridge recently established a large plant, and this has been selected for illustrating in this article the construction and arrangement of duck houses.

THE INCUBATOR HOUSE AND FEATHER-DRYING LOFT

This Pennsylvania farm was chosen especially for a duck ranch because of its combining the essential qualifications in an unusual degree. The land is slightly rolling, giving excellent drainage; on the rear half



BROODER HOUSE, 250 FEET LONG

there is a small brook well adapted for water-yards and sheltered on the north and west. Here about a thousand head of breeding ducks are

kept. About half of these are in small, semi-detached houses, each 8 x 16 feet in size, set about thirty feet back from the pond formed by damming the small brook. Each flock of fourteen ducks and three drakes occupies a pen 8 x 8 feet and has a yard about 16 x 60 feet, half of the yard being in the pond. A tramway for conveying food to the pens extends along the front of the houses. Other laying houses, 16 x 30 feet and accommodating fifty ducks each, are built lower down the brook, and the ducks are given large yards extending some 200 feet across the little valley.

INTERIOR OF NURSERY BROODER, SHOWING HOVERS AND ALLEYWAY

The 48 360-egg incubators are housed in the basement story of a building 42 x 44 feet, the second story of which is a feather-drying loft. The incubator cellar is set eighteen inches below the ground-level and has a brick foundation three and a half feet high; the ground outside is sloped up to top of foundation. The wooden walls of the incubator rooms are of three thicknesses of boards with sheathing paper between, and twelve half-windows, hooded to exclude the rain, give light and air to the room; three cupolas give ventilation.

From the incubators the baby ducklings are taken to a brooder house 25 x 250 feet, in the center wing of which are set the large hot-water heaters to give the necessary heat to the brooders. The first one hundred feet, of this house contains the "nursery brooders." This section is divided into pens 4 x 10½ feet, a walk four feet wide extending

COLD BROODER HOUSE, 300 FEET LONG

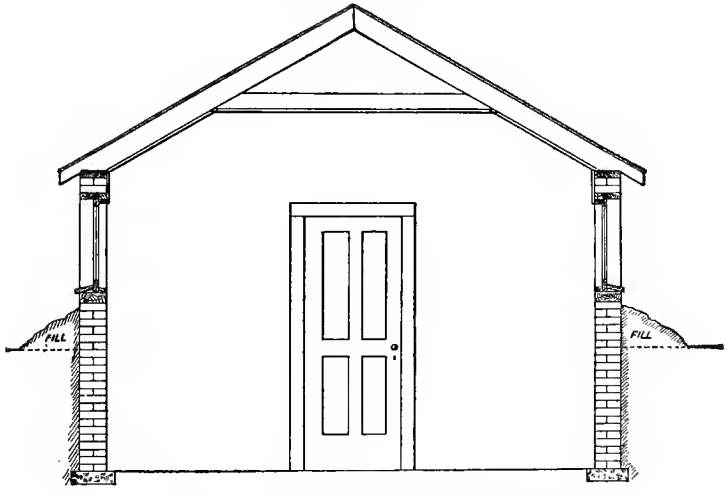
through the entire length of the house giving access to the hover pens for feeding and watering. The illustration of the interior of the nursery brooder house shows the hot-water pipes and hovers set three feet in from the walk, which gives feeding and watering space between the hovers and the walk; this part of the house is well lighted by windows in the monitor top, which windows also serve for ventilating. Small runs, 4 x 10 feet, give outdoor air and exercise room in favorable weather. From these nursery brooder pens the ducklings are driven through to the second brooder house, 150 x 25 feet, where the pens are 6 x 10½ feet and outside runs 6 x 15 feet. Here are hot-water pipes and hovers, and the four-foot-wide walk extending the full length of the house; but the temperature is

FATTENING SHED AND YARDS

lower, and the ducks are gradually moved along with a steadily lower temperature, until, when about five weeks' old, they are graduated into one of the cold houses, which have no artificial heat. Of these there are several 200, 250 and 300 feet in length by twenty-five feet in width, with yards outside for exercise and fresh air and simple pens within for sleeping-rooms. These cold houses, also the large fattening houses, are practically great sheds for shelter at night, and in stormy weather they are chiefly roofs to turn off the rain. Pekin ducks reach market maturity in about ten weeks, and there are about two and a half weeks each of nursery brooder, second brooder, cold house and fattening pens on the way to market. On such a great duck plant as this the buildings are located and built to facilitate the necessary work in the most efficient manner, to the end that no steps be wasted. Everything is reduced to a businesslike system.

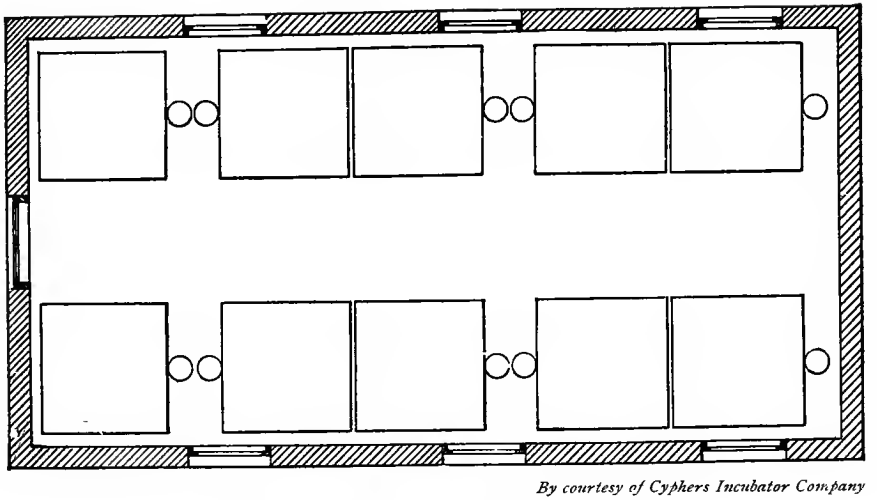
Incubator Houses

Incubator houses are best made in half-cellars, and when possible should be put up early in the season, so they will become thoroughly dry, and should be located on high, dry ground. It is often desirable to hatch late in the spring or even in the summer, and a house entirely above ground then gets too warm for the best work. With a half-cellar the air strikes the wall, which the outer ground keeps cool, and the temperature can be kept down to sixty or sixty-five degrees, excepting in the very warmest weather. A row of windows is placed on either side, well up toward the ceiling, so that a window can be opened on either side of the house to afford ventilation without a draught striking the machines.



By courtesy of Cyphers Incubator Company

FRONT ELEVATION OF INCUBATOR HOUSE



By courtesy of Cyphers Incubator Company

GROUND PLAN OF INCUBATOR HOUSE

All things considered, the half-cellar herewith shown is one of the best that has been devised for the purpose. The temperature keeps very even and there is just enough natural moisture in the air to give the best results. To build it requires an excavation three feet deep and the building of a wall four feet high, with an additional three feet of woodwork above it. Bank the earth up against the wall so as to make the cellar four feet deep. The door is in one end of the building, and the stairs are inside, so that they are safe from the weather. Three half-windows are used on each side, and are double glass, being placed on each side of the window-frame. The inside of the room of the cellar is sealed with matched stuff. The sealing runs inside of plate, up studs and rafters, to a point ten feet from the floor, where it crosses on the tie beams. The roof, ends and sides may be either shingled or papered. In such an incubator cellar it is well to have the incubators lefts and rights for greater convenience in the care of them.

The ground plan shows a half-cellar arranged for ten large-sized incubators, but the size of cellar can obviously be adapted to the number of incubators it is intended to run.

The incubator cellar is best set three feet in the ground, with a one-foot banked wall above, making four feet in all under ground. There should be eight feet head room from the floor to the plates or ceiling. Do not build a lower ceiling, as a lower room will not give sufficient cubic feet of air space to allow the air to be kept always fresh.

The Brooder House

A practical, sensible and economical house for brooding chicks or ducks is described as follows by Charles A. Cyphers, president of the Cyphers Incubator Company: "The most popular brooder house in use to-day is the hip-roof, single house. This house may be seven feet at the back, eight feet at the ridge, and five feet at the front. It is usually put up sixteen feet wide. It has a three-foot-eight-inch walk in the back, with the hover runs twelve feet long, divided off in five-foot sections. To each five feet of hover run there should be one six-light 8x10 window set in the center of the front, about two feet from the floor, and facing the south. Do not put more glass in a brooder front than this, as it makes it too warm in summer and too cold in the winter, and there is positively no advantage gained. It is well to put at least two windows in the back, or north side, of each twenty-five feet of brooder house. These should be double windows for use in the winter time; the outer sash can be removed in the summer, and the inner sash should be hinged so that it may be let down to keep the building cool in the summer time. It is well, also, to hinge the front windows at the bottom, so that they, too, could be opened during the warm weather. This is all the ventilation that it is necessary to provide."

THE COMMON DISEASES OF POULTRY

DR. NATHAN W. SANBORN, MASSACHUSETTS

THE twentieth-century poultryman is not satisfied with the knowledge of ten years ago. He wants the results of the investigations of the times in which he lives, and insists on getting them while they are fresh and new. This applies not only to breeds, varieties, methods of housing, and feeding, but to the diseases he must meet from year to year. It is a sign of promised success when a poultryman insists on knowing causes and prevention of disease rather than cures. Sure-cures for the ailments of poultry are only too many—and it is well known to some of us that dependence upon these "medicines" has ended in the failure of more than one poultry plant. It is the man who looks ahead, learns the causes of disease and prevents their beginnings, who gets real satisfaction out of the keeping of healthy poultry. So you will understand at the outset why I lay so much emphasis upon prevention of poultry ailments. Understand thoroughly the pitfalls of disease, that you may take your birds safely around them, rather than sweat in the unsuccessful attempt of getting them out of the pit that you probably have dug.

The most common factor in causation of poultry diseases is filth. This may be impure water, foul air from crowded houses or contaminated air from dirty droppings—boards or floors. A yard that is bare of grass and foul with the accumulated droppings of several years may lead to diseases of more than one kind. While filth alone does not surely lead to disease, it is of great importance to success with poultry that the bird's life is passed in clean quarters. Catarrhs, roup, cholera, and several other common diseases of poultry, are intensified if they are not fully caused by filthy conditions.

Another cause of disease is improper feeding. Too much of the corn products, to the exclusion of foods that would balance up the complete ration, unduly fattens the bird, and is often followed by liver disease

and breakdown when the bird gets to be over twelve months of age. Too large a proportion of meat tends toward rheumatic condition, and is a common cause of winter diarrhea in laying stock. Even the absence of grit is sufficient to cause indigestion, and I have seen large flocks supposed to be dying from cholera, when careful study of the situation made sure that the one thing wrong was "no grit in reach." Many soils are deficient in grit; most hen-yards contain only old grit that has passed through the birds' digestive system and has lost all grinding properties. Oyster shells fill a place in the birds' needs, but they do not do the work that grit will do.

Lice and mites have a part in the starting of disease. Lice irritate the birds, make them uneasy, and multiply rapidly when disease is present. Red mites (spider lice) weaken the birds by sucking the blood, thereby lowering the birds' vitality and furnishing better breeding-ground in which the disease can work.

Dampness is not conducive to healthy poultry. Birds may keep well under wet conditions, but it is a factor in disease that should be kept in mind. A leaky roof, a damp surface soil, a foggy valley, have led, in my knowledge of poultry plants, to more than one serious epidemic of disease. Dampness combined with any of the filth conditions I have mentioned in this article is usually followed by some disease of the mucous surfaces.

Crowding of birds, whether in the laying house of winter or in the brooder of the springtime, is dangerous. The overfull brooder soon has the right number of chicks through the death of many, but this is not an economical method of chicken-raising. The crowded chicks sweat, chill, take cold, and die of catarrhal troubles of different names. The overfull roosts of the laying house seldom pay. The birds are not rested by the night's roosting; they foul the air of the house, and overload the droppings boards with a product which contaminates the air they breathe.

Extremes of temperature are hard for the bird to bear, and tend to produce some of the winter ailments. Better have a house cold all the time than one hot at noon and near the zero mark at midnight. Our birds are well dressed for cold, but have no way of adjusting their clothes to the hot air of a glass-front house at noonday. The change from a temperature of eighty degrees at one o'clock in the afternoon on a sunny winter day to zero or below in the early morning hours is too much for

most birds to stand. It is followed, more often than is commonly understood, by the lung diseases, such as bronchitis and pneumonia. Better have the cloth-covered window-frames, that give a cold house both day and night, than a building with a front largely of glass. This glass-lighted house will be too warm by day and too cold at night, unless some means are provided for the proper ventilation and equalization of the temperature. An even temperature of day and night will do much to avoid some of the common diseases of winter.

The improper use of food and condiments will help toward the production of disease, if, indeed, they do not directly cause poultry ailments. A ration too rich in starchy food, or containing a large proportion of indigestible elements, too much meat and bone, will upset the digestion of birds that are off a free range. Birds running at large will do quite well on almost any kind of food, but the yarded stock must be carefully fed for good results. The overuse of spice does positive harm, and it had better be let alone altogether than used carelessly.

Some Common Diseases

The diseases that appear in the flock of the average keeper are those connected with either the digestive or the breathing systems, the first as the result of faulty feeding, the second because of improper housing.

Indigestion usually shows itself in the loss of appetite and possibly some diarrhea. The bird is "off its feed." It mopes in corners of house or yard, and is slow in all its motions. Its feathers are dull, and the comb is lighter in color than normal. These birds need a light diet of simple feeds—half starved, in fact—and a grass range in summer and a clover diet in winter. They should be made to work for all grain, feeding it in deep litter. No work, no food! If the birds have anything wrong with the bowel discharges, whether constipation or diarrhea, a tablespoonful of castor oil in mash for four birds will help get rid of some of the irritating material. Other medicine than this I should not advise. A better diet and good care will cure most of the sick birds.

The crop may get inflamed as the result of eating some irritant poison and the organs beyond may become involved. Paris green (and other arsenical poisons) is the usual poison that our birds have access to. So much of it is now used for spraying orchards and other crops that we have become careless in its use. Birds suffering from inflamed crops—

gastritis, we call it—seem to be in pain and are very thirsty. They are seen to be going to the water-dish every few minutes. Give these birds clover tea in which arsenite of copper, one one-hundredth of a grain for each quarter-pint, has been dissolved, and let this be their only liquid. The diet should be little except a baked mash of cornmeal and bran. The ideal diet would be that to be had from a run in a grass-covered orchard.

Diarrhea and cholera are two diseases that have similar symptoms at the start. Diarrhea is slightly infectious, while cholera is one of the easiest diseases to take from bird to bird and from farm to farm. Diarrhea is usually a mild disease. Cholera runs a rapid course, with high fever. Diarrhea is caused by wrong feeding, bad hygienic surroundings, or lack of grit. Cholera is due to a disease germ that puts in its work in healthy birds just as surely as in debilitated stock. Most of the so-called "cholera cases" of the poultry papers are bad diarrheas. Cholera is seldom cured. Many of these so-called cases recover—and this fact is against the diagnosis.

The well-fed bird on farm range seldom has diarrhea. It is the yarded bird, that looks to the owner for every particle of food, that is reported as having a bowel discharge. Good feeding, as put forth in the prevention of disease at the opening of this article, will prevent this trouble and cure mild cases. Sulphocarbolate of zinc, ten grains to each pint of drinking water, will do good service in overcoming the irritation in the intestines.

Cholera always comes unexpectedly, runs a rapid and fatal course, and is attended by intense pain. There are fever, total loss of appetite, and a bowel discharge that is more watery as the hours go by. The bowel discharge is fairly normal in colour at first, but soon changes to a light color, yellow and red in streaks, that may be all red in twenty-four hours. You know that birds that were well two days before are decidedly sick, and you decide mighty soon that the chances of recovery are slim. Cholera is brought from a neighbor's flock of sick birds without effort on the shoes of any one passing from place to place. It is passed from pen to pen, from house to house, in the same way. There is no good cure for cholera. Treat all birds as you would for a bad diarrhea, and if many of them recover you may be sure that you have not had cholera. All sick birds should be kept by themselves and away from the rest of the flock. This is true of any sickness that may visit your yards.

Gapes.—This is the one parasitic disease that is likely to be at all common to many poultry yards. This condition, known to us by the peculiar gaping of the chick, is not found in all yards in sections of the country where it is common. A worm makes its home in the windpipe of the bird and causes the irritation of the mucous lining. In turn the bird tries to get rid of it by swallowing or coughing. This parasite or worm has its home also in the earthworm. Strange as it may seem, the earthworm is, therefore, the source of trouble. But the gapeworm must be present in the earthworm or no gapes results. A few gapeworms do little injury, but when the number is large the bird suffers intensely. Hundreds of thousands of chicks die of gapes in some of the sandy regions of the eastern United States. Chicks seem to contract this disease easily, while adult birds on the same place are free from it. When it is once introduced into a yard it is seldom exterminated, except by putting new chicks on fresh soil in new yards.

Prevention is everything in this trouble. It is hard work to get a wire into the windpipe of a small chick, yet it is common to introduce a wire and entangle the worms in a twisted horsehair on the end of the wire. In this manner a few worms are dislodged and more of them are coughed up later by the chick. Some poultrymen put the chicks into a box covered with burlap; air-slaked lime is then dusted through the cloth cover and is breathed by the chick. This irritates the bird and is followed by coughing, which gets rid of some of the gapeworms. Whatever method is resorted to, one cannot remove gapeworms without hurting the chicks.

Catarrh and Roup.—The diseases of the breathing apparatus are catarrh, roup, canker, diphtheria, bronchitis, and pneumonia. Of these six, catarrh and roup are the most common to all sections and yards, and present the same symptoms at the commencement of the sickness. The first case that appears cannot be named for a few days. All start with a slight running at the nose, probably sneezing, and some watering at the inner corner of the eye. Catarrh seldom presents more symptoms than these. On the other hand, roup passes from these symptoms to those of more severity. The disease is intense. There is swelling of the sides of the head, the breath is strong-smelling, and the nostrils are tightly closed with thick mucus. If you have a flock of birds that present the catarrhal symptoms, with the addition of that rotten odor to the air of the roosting house in the early morning, you may know you have roup to treat.

All these ailments call for arsenite of antimony in the early stages. Catarrh will soon clear up and roup be made more mild. The dose of this medicine is small. It is one one-hundredth of a grain for each sick bird, added to the drinking water for one day's use. Prepare fresh each day. If several cases are on hand it is well to add a half-dose to the drinking water of each well bird.

Roup needs more energetic treatment. After all the trials of new drugs, I have come back to the old, well-tried remedy, common kerosene. Put a tablespoonful of kerosene on the top of a pailful of cold water and dip the head of each bird through the film of oil into the water, hold for an instant and then withdraw. Do this twice a day, and use the arsenite of antimony in the drinking water of every bird on the place.

All sick fowls should be put by themselves, lest the well ones contract the disease. All drinking vessels should be scalded. It is through the vessels and water that the disease is largely spread. When the disease is eliminated, clean up all yards and pens, lest it appear another season from germs that stay on the premises. It has always seemed to me that catarrh is quite likely to pass into roup whenever the pens are in a filthy condition. Catarrh, filth, and wet combined lead to the roupy outbreak.

Diphtheria and canker are winter ailments. They appear generally in fowls that have been exhibited at shows, and have been exposed to long express trips, or have roosted in a cold house near a crack in the wall. Canker is more local in its action than diphtheria. A patch or spot in the throat or mouth is a prominent symptom. In canker this spot is yellow, while in diphtheria it has a leaden cast. The membrane in canker is thicker than in diphtheria, and is not bound so tightly to the mucous surface underneath. Both diseases respond to similar treatment. Possibly the diseases are the same. Swabbing the patches with a full-strength solution of peroxide of hydrogen twice a day, and the internal use of a one-grain pill of calcium sulphide three times a day, will give best results.

Bronchitis is a catarrhal condition of the mucous lining of the bronchial tubes. The fowl rattles in its breathing, is dumpish in all its movements, and quite likely shows some catarrh of the nostrils. Bronchitis calls for aconite. One-drop doses of the tincture, three times a day, with the birds kept in a dry, sunny house on a light diet, will help cure these late-fall and early-winter troubles.

Pneumonia is rarer than any of the common diseases. Pneumonia is so fatal that it is seldom recognised by the average poultryman. The bird has some difficulty in breathing. The number of breaths per minute is large, and the air exhaled is hot to the hand held near the mouth and nostrils. One's ear held against the bird's chest may reveal a sound similar to the movement of thin parchment paper. The bird has no appetite, is feverish, and usually very constipated.

Pneumonia is fairly common in the winter. It is the single cases appearing often that make this one of the dreaded diseases of the cold season. Treatment should be prompt. The man who is with his fowls is more likely to recognise this disease and treat it early than is the person who sees his flock only morning and night. The early use of a tablespoonful of castor oil, with drop doses of tincture of aconite every two hours, will usually help the fowl. While this disease is not easily passed from fowl to fowl, there is danger enough to call for quarantine.

WHITE LEGHORNS RANGING ON FAIRVIEW POULTRY FARM
(Owned by H. J. Blanchard, New York)

PRINCIPAL INSECTS INFESTING POULTRY

A. F Hunter, Massachusetts

ALL poultry-keepers realize the very great importance of keeping their flocks free from parasites. Sometimes fowls become so badly infested with parasites that they are totally incapacitated for work; brooding hens frequently die upon their nests; newly hatched chicks are lost in very great numbers as the result of carelessness in keeping the fowls and their nesting and roosting places free from lice and mites.

There are several distinct species of *Mallophaga*, or lice, as they are popularly known. The various species are partial to particular parts of the body, as the rump, under the wings, between the wing feathers, and upon the head and neck. They subsist upon the productions of the skin, devour fragments of the feathers, and even feed upon the barbs of the feathers, especially attacking those of the saddle and hackle, the latter sometimes showing curiously jagged and notched edges when birds are severely infested. Often lice are present in great numbers on fowls

FIG. 1

FIG. 2

FIG. 3

FIG. 4

DIFFERENT SPECIES OF BODY LICE

Fig. 1: *Lipeurus variabilis;* primary and secondary feathers and wings in chicks. Fig. 2: *Menopon biseratum;* large wandering hen louse; common to all parts of the bird. Fig. 3: *Goniodes eynsfordii;* head and neck feathers of fowls and chicks. Fig. 4: *Menopon pallidum;* common pale wandering hen louse.

suffering from diphtheritic roup and gapes. By their debilitating effects the constitution of the fowls becomes impaired and rendered more susceptible to any infectious disease. Darkness and filth are especially

favorable to the development of lice and mites. They thrive best in dark, damp, badly ventilated and dirty runs and houses.

Cleanliness is the first step toward prevention, and the most powerful aid in the extermination of the pests when once established. If facilities for dust-bathing are furnished, and the quarters kept clean and well ventilated, there will be little difficulty with lice, as the fowls will keep themselves pretty well freed from them. The quarters should be thoroughly whitewashed twice a year, preferably spring and fall. The floors (if of wood), walls, nests, perches, etc., should be well washed with a whitewash sufficiently liquid to flow freely and run into every crevice. A little carbolic acid solution or kerosene oil added to the whitewash will make it still more effective and cleansing. The addition of a little soft soap (or potash lye) will make the solution more destructive to the parasites. The addition of a handful of sulphur and lime mixed in the road dust provided for the dust-bath makes the latter more effective.

Dusting the sitting hens with powdered pyrethrum, known also as Persian insect powder, or bubach, is an excellent remedy. All dusting remedies, while efficacious, cannot reach the eggs, commonly called nits, which in a few days hatch out another lot of lice. Therefore, sitting hens should be dusted several times at intervals of about eight days. Usually three applications will suffice. If the dusting is thoroughly done the chicks hatched by these hens will be practically free from lice and should be kept from infected birds.

The Chicken Mite

The chicken mite is scientifically called *Dermanyssus gallinæ* Redi. It is commonly known as "red mite," or "red spider louse." Unlike the lice, it does not live in the feathers and upon the bodies of fowls, but inhabits cracks and crevices of the roosts, nests, walls, etc., coming out at night to prey upon the birds upon the roosts or attacking them while upon the nests. Instead of feeding upon the body excretions, feathers, etc., of the fowl, as do the lice, the food of mites is blood. It is only when engorged with blood that they are red. Their natural colour is a light gray, with tiny dark spots showing through the skin. In many respects they are worse than lice, and poultrymen should do everything in their power to destroy them if they find a lodgment in the houses.

In a recent bulletin (No. 69) issued by the Iowa Experiment Station the following interesting and practical facts are given: "The mites are of peculiar and stealthy habits of life, rather unlike that which one naturally expects from a parasite. Indeed, they are only semiparasitic, and, as a rule, remain upon the fowl only long enough to secure a meal. They are very active in their movements, and seem to be ever on the lookout for a victim. On account of their vigorous and vicious habits they may be styled the wolves of the insect parasites of fowls. The

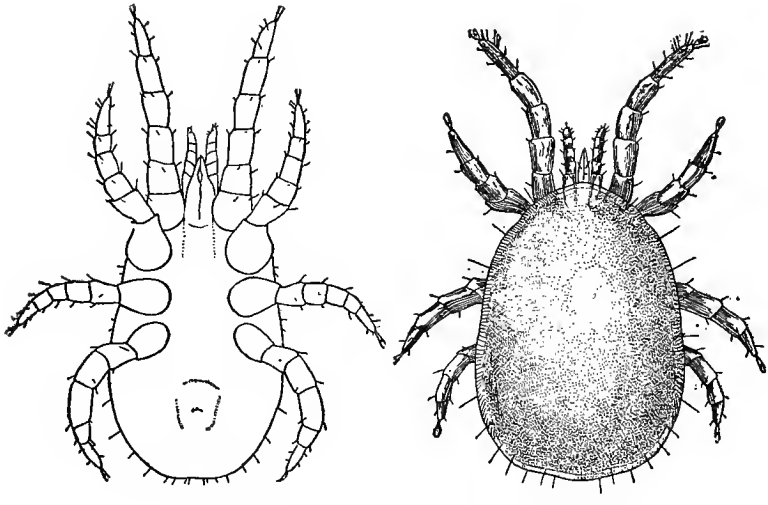


FIG. 1 FIG. 2

FORMS OF THE CHICKEN MITE

Fig. 1: Young chicken mite, lower view. Fig. 2: Adult chicken mite, upper view. Both greatly magnified

mites hide in crevices and under objects in the henhouse during the daytime, while the chickens are outside, and lie in wait for their return. They lay their eggs and the young are hatched in these hiding places. A barrel affords an excellent hiding and breeding place, as the mites lodge between the staves and under the hoops. In the nests they are to be found under the straw or other nesting material. It is a noteworthy fact that a place which shows only a few mites on the surface may contain vast numbers in the crevices or under objects. Often they become so plentiful that they overflow the hiding places and appear in hordes upon the exposed surfaces.

A Reliable Remedy

"The most effective exterminator found was kerosene emulsion,* made as follows: Take one-half pound of hard soap, shave it into a gallon of soft water and put it on the fire and bring it to a boil. By this time the soap will have dissolved. Then remove the soap solution from the fire and stir into it at once, while hot, two gallons of kerosene. This makes a thick, creamy emulsion, which is made ready for use by diluting with ten volumes of soft water and stirring well. It can be utilized as a spray, dip or wash.

"It is necessary to use soft water, for hard water decomposes the soap and destroys its emulsifying power. We used white laundry soap, but any good hard soap will do.

"Make up as much of the stock emulsion as it is thought will be needed. This can be kept in a suitable vessel and a portion taken out and diluted as needed. If the bucket or holder attached to the spray-pump holds five gallons, one-half gallon of the stock emulsion should be put into the bucket or holder and four and one-half gallons of soft water added and the whole well stirred. It is then ready to be sprayed on the places occupied by the mites. A beginning should be made at a particular place and the whole habitation of the mites sprayed in a regular order, of which account should be taken so that the same order may be followed in subsequent sprayings. The spray should be directed with special care into all crevices, holes, joints, or other hiding and breeding places of the mites. The first spray of kerosene emulsion will kill within five minutes all of the mites and eggs with which it comes into contact, but many mites will be left in the hiding places unaffected by the spray. Hence the spraying should be repeated as soon as the first spraying is completed. Even this will not kill all of the mites, hence a third spraying should be done as soon as the second is completed. At each spraying the beginning should be made at the same place and the same order followed

* There is now upon the market a combination spray-pump for mechanically mixing oil and water. By putting the kerosene in one tank and the water in another, any percentage of the two combined can be obtained by simply setting a gauge and pumping out the mixture. This apparatus, simple, cheap, and effective, does away with the somewhat troublesome method of making kerosene emulsion by hand. Every well-established poultry plant should have either a knapsack or hand combination oil-and-water sprayer. The same apparatus can also be used for whitewashing by substituting a coarser nozzle.—Editor.

as in the first. These three sprayings, done in one day and in rapid succession, will destroy nearly all of the mites, but, as my researches have shown, many eggs are left in places untouched by the spray. If mites are seen crawling about the building the next day, it should be sprayed again.

"One might ordinarily suppose that he had now exterminated the mites; but such is not the case, for in about three days a crop of young mites will be found hatched from the eggs which escaped the first spraying. If these should be allowed to go undisturbed it would not be long until the building would be as badly infested as at the beginning. Therefore the spraying should be repeated once every three or four days, spraying two or three times on each occasion, for about two weeks. The spray should be applied to every part of the building that is likely to contain the mites. In a two-story building they will crawl up a post and find lodgment upon the second floor, even if chickens do not go there.

"The procedure described will, with very little doubt, be effective in ridding a place of mites, but we would advise that a constant watch be kept, and the spraying repeated when mites are seen at any subsequent time. Extermination of the mites* may be hastened by dusting the fowls with pyrethrum powder after they have gone to roost the evening before the spraying. The powder will drive the mites from the birds, and as a result few, if any, will be carried out upon their bodies the next day."

* Mites are not easily destroyed by the use of insect powders. In fact, these creatures are not insects at all, but belong to a different group. They are allied with the spiders, and, unlike the true insects, such as the lice, have a peculiar breathing apparatus characteristic of their class. The various insect powders prove valuable in certain cases by closing up the breathing organs or spiracles, situated along either side of an insect's body, when dusted upon them. But if dusted over mites or spiders it would not necessarily destroy them, even though it made them uncomfortable for a short time and forced them from the body of the fowl.—EDITOR.

FIRST PRIZE BLUE GAME COCK

The Fisheries Exhibition, Aquarium, Westminster

The Poultry Book

By
HARRISON WEIR, F.R.H.S.

American Edition Edited by
WILLIS GRANT JOHNSON
Assisted by
GEORGE O. BROWN
as Associate Editor
and
Many American Experts

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This book has been revised and rewritten from the American point of view by American experts.

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"The Jungle-fowl"

"Ancient and Modern Game-cocks"

"An American Collection of Cock-spurs"
DR. H. P. CLARKE, Indiana

*"The Modern Game-fowl"

* Continued in Part VII

Photograph by A. R. Dugmore.

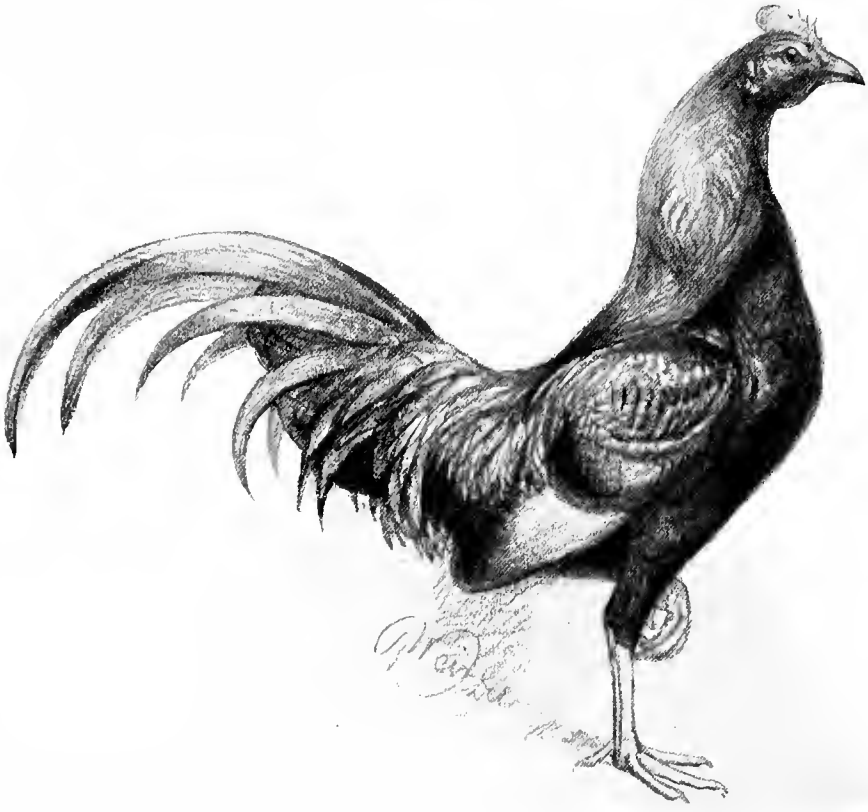
THE FORKED-TAIL JUNGLE-FOWL. COMB AND WATTLE HAVE CHANGEABLE COLORS

Owned by Homer Davenport

THE JUNGLE-FOWL

THE Jungle-cock [*Gallus bankiva*] is about one-third the size of our domesticated races, measuring from point of beak to the extremity of flattened tail about two feet four inches, and nearly fifteen inches in height from the level of the feet to the top of the head, not including crest on indented comb. The wattles resemble those of the domestic cock, the deaf ear in some being red and in others a light greenish-blue, though they are larger in some breeds of domestic fowl. The female is smaller than the male, with scarcely any comb or wattles, but the throat is covered with feathers forming a remarkable distinction from the domestic hen, the throat of which is usually nearly naked. The females do not differ in color among themselves in plumage, like those of the tame varieties. The cry of the Jungle-fowl is in some measure different from that of our domestic species, but there is much resemblance in their habits. Captain Skinner, in his "Excursions in India," says: "In some parts of the forest we saw several Jungle-fowl; they have exactly the same habits as domestic poultry. The cock struts at the head of his hens and keeps a strict watch

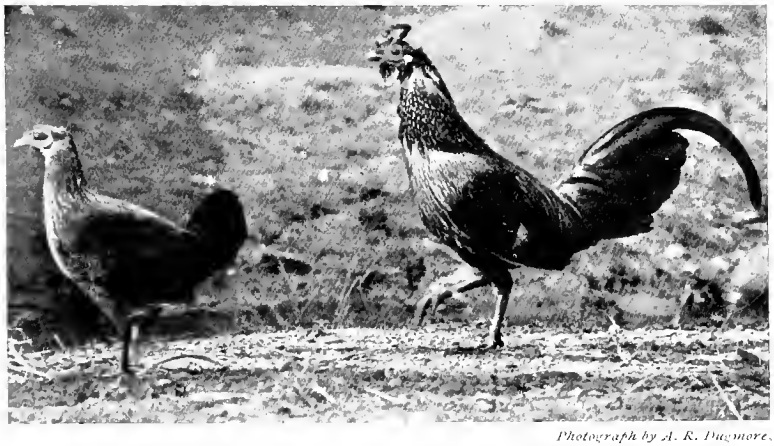
over their safety. Whenever disturbed by us, he flew to the highest branch of some tree beyond our reach and crowed with all his might, while his dames ran into holes and corners to escape; they are so cunning



INDIAN JUNGLE-FOWL

that we found it impossible to get within shot of them, with all the caution we could use."

The Shecarries, or low-caste, in India, catch Jungle-fowl by the following method: "Two or three men go together and proceed in this manner: A line thirty or forty yards long is fastened to the ground, with wooden pegs at each extremity, and is then elevated by props to the height of about eighteen inches. To this prop nooses of horsehair are fastened about two feet apart. When the birds attempt to pass under the line



Photograph by A. R. Dugmore.

GRAY JUNGLE-FOWL—WILDEST AND HANDSOMEST OF THE SPECIES OF JUNGLE-FOWL

Owned by Homer Davenport

they are caught in the noose by their necks. Sometimes a similar line is fastened to the ground and left lying there with all the nooses spread, and as the birds pass over them they are caught by the legs; these lines are never spread where there is much jungle. When the lines are ready, the men go a considerable distance and beat the bushes, thus driving the game toward them." This method is precisely the same as that used by many of the savage tribes of the South Sea Islands. It is also put

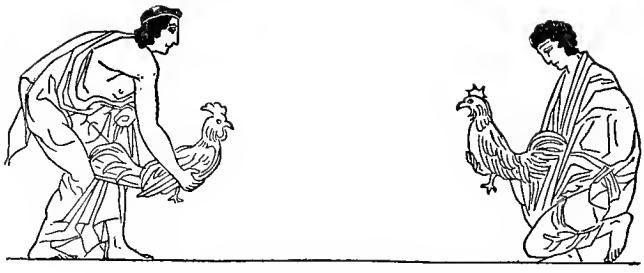
Photograph by A. R. Dugmore.

THE RED JUNGLE-FOWL (*GALLUS FERRUGINEUS* OR *BANKIVUS*), THE PROTOTYPE OF ALL BREEDS OF DOMESTIC CHICKENS

Owned by Homer Davenport

into practice for catching pheasants, etc., by poachers in England. The Mussulman natives of Hindustan are in a degree fond of cock-fighting. The Hindus, on the contrary, do not tolerate the existence of poultry; a Hindu would sooner forfeit his life than wear a fowl's feather. In the Bay of Amphila, in Abyssinia, Donakei, also in Adaiel and Sanauli, the inhabitants entertain a prejudice perhaps against the common fowl, the flesh of which they hold in abhorrence; this may tend to the idea of these tribes having sprung from an Egyptian origin.

A fine specimen of the *Gallus bankiva* in the collection of Mr. Harrison was brought from the northern circars of India; whether this is the original stock from whence all our domestic varieties have sprung I leave others to determine; personally, I do not incline to that opinion. There is a reference in "Dampier's Voyages" to a small species seen at Condor; and at the same place (in "Cook's Last Voyage,") a "wild hen, of splendid color, but less than ours in Europe," is described as having been shot.



ROMAN COCK-FIGHT
From a painting on a vase in the Gregorian Museum, Rome

ANCIENT AND MODERN GAME-COCKS*

"Heaven from all creatures hides the book of fate." —POPE'S *Essay on Man.*

THE existence of the Game-cock is almost prehistorical. It is mentioned in the earlier records of China. Cock-fighting is commended, with other amusements, in the codes of Manu more than a thousand years before the Christian Era. Dempster states the Game-cock was indigenous in Persia, and conveyed thence to other countries. Athenæus, indeed, quotes from a work of Menodolus some lines by which this assertion is confirmed; and Aristophanes in two places calls the domestic cock a Persian bird. It is proved by more modern accounts that this species of fowl is at present found wild in the East Indies and many neighboring countries. Sonnerat found them in Hindustan; and they were seen by Cook and Dampier on Pulo Condor and many islands of the South Sea. According to the testimony of Gemelli Careri, the Game-fowl was indigenous in the Philippine Islands. Morolla states that it was to be found wild in the kingdom of Congo; and it is asserted by Neineggo that it was to be met with in Georgia in a wild state as late as 1797. The account, therefore, of the Greeks that they obtained domestic fowls from Persia may be admitted, but as in cock-fights one Persian overcame another, how could they convey the idea of victory of the Greek over the Persian? The Jungle-fowl is the accepted progenitor of the Game-fowls.

That cock-fighting was a favorite pastime long ago is proved by the frequent mention of it by various authors. Pliny says it was exhibited annually at Pergamus in the same manner as the combats of gladiators.

*This part has been read by the following experts on Games: George S. Barnes, of Michigan, and John Glasgow and John Filkin, both of New Jersey. It was finally revised and partly rewritten by the American editor.

According to Petronius, a boy was promised a fighting cock. From this it appears that even boys kept fighting cocks for this pastime. Cock-

HIMERA COINS
Very much enlarged to show form of birds

fights are delineated on vases found at Pompeii, on ancient sculpture in Rome, and other places. Æsdinus reproaches Timaichus for spending the entire day in gaming and cock-fighting. Plato complains that not only boys, but "grown-up" persons, instead of laboring, had birds for fighting, and employed their whole time in idle amusements.

Coins of Persia, Himera and Afghanistan have their effigy of cocks. Cock-fights were represented also by the Greeks on coins, as we are told by Pollux; and this seems to prove that these people were as fond of the sport as their neighbors of Pergamus. Mr. Pegge had engravings made of two gems in the collection of Sir William Hamilton, on which is seen a cock in the humble attitude of defeat, with his head hanging down, and another in the attitude of victory, with an ear of corn in his mouth as the object of contest. On the other stone are two cocks fighting, while a mouse carries off the ear of corn for which they are contending. Two cocks fighting are represented on a lamp found in Herculaneum.

ASIA
An Indian bird which was crowned by Alexander

GREEK
Struck in India, *circa* B. C. 335-280

The Rhodian fowls were celebrated fighters, as were those of Medea, Chalcis, and Tanagra; the last were said to be large, powerful birds of great courage. Hieroglyphically (*Baily's Dict.*, 1736), a cock signifies a noble disposition of mind, there being no bird of a more generous or undaunted courage at the sight of imminent danger. "While the cock," says another, "is the emblem of strife, of quarrels, of haughtiness, and of victory, because he rather chooses to die than yield, therefore he is called a bird of Mars."

"He is likewise an emblem of jealousy and vigilancy."

"The cock crows when he is conqueror, and thus gives notice of his conquest."

"Cock-fighting appeared on the coins of Dardania, and under the presidency of love. The battles were often fought in the presence of the god Terminus (Hermes among the Greeks), and the palms destined to the conqueror were placed upon a pedestal."—*Gentlemen's Magazine.*

"Upon a coin of Athens we see a cock crowned with palm."—*Encyclopedia des Antiq.*

"Polyarchus gave public funeral and raised monuments to cocks, on which were placed epitaphs in praise of the birds."—*Ælian, Vai, Hist.*, VIII. 4.

"The sport passed from the Greeks to the Romans, and Caracalla and Geta were great cock-fighters."

"It is said that the gaffle, or modern metal spur attached to the legs of the cock before being put down to do battle, is a modern invention. This is not so, as it is mentioned in the Anglo-Saxon Synod, and was sometimes made of brass."—*Lye's Dict. Sax.*, v. *Geaflas.*

There is great reason to believe that the Game-cock was held in such high estimation by the Romans as to become almost a deity. They were not infrequently buried with some degree of honor, as is partially proved by a discovery of a Roman urn at Lewes in 1814 by Doctor Gideon Mantell, when digging in his garden near the castle. An account and description of the find are given at some length in "Horsfield's History of Lewes."

Markham, describing a Game hen, says: "If she have weapons she is the better." Mr. Brent speaks of spurred Game hens in the *Journal of Horticulture;* and that excellent authority, John Harris, informs me that he has somewhere read that the Ancients possessed spurred hens. From

the foregoing it may be seen that it is possible, though not very likely, that some of the bones here figured are those of hens rather than cocks.

The old English Game-cock has held its own against all comers. Bright and beautiful he stands to-day, as he stood with eager, bold, dilated eye, full of defiant gaze—a monarch bird, clad in lustrous feathery garments of the brightest sheen—when, unflinching and undaunted, he faced his foe, while old Roman warriors made the ring in which he fought on English soil. Though they beheld with wonderment his high prowess and daring deeds, not even then was he more cherished and better cared for than now. On the grassy mead he leads forth his hens to meet the rising sun, and with voice clear, loud, and shrill he proclaims "'Tis day."

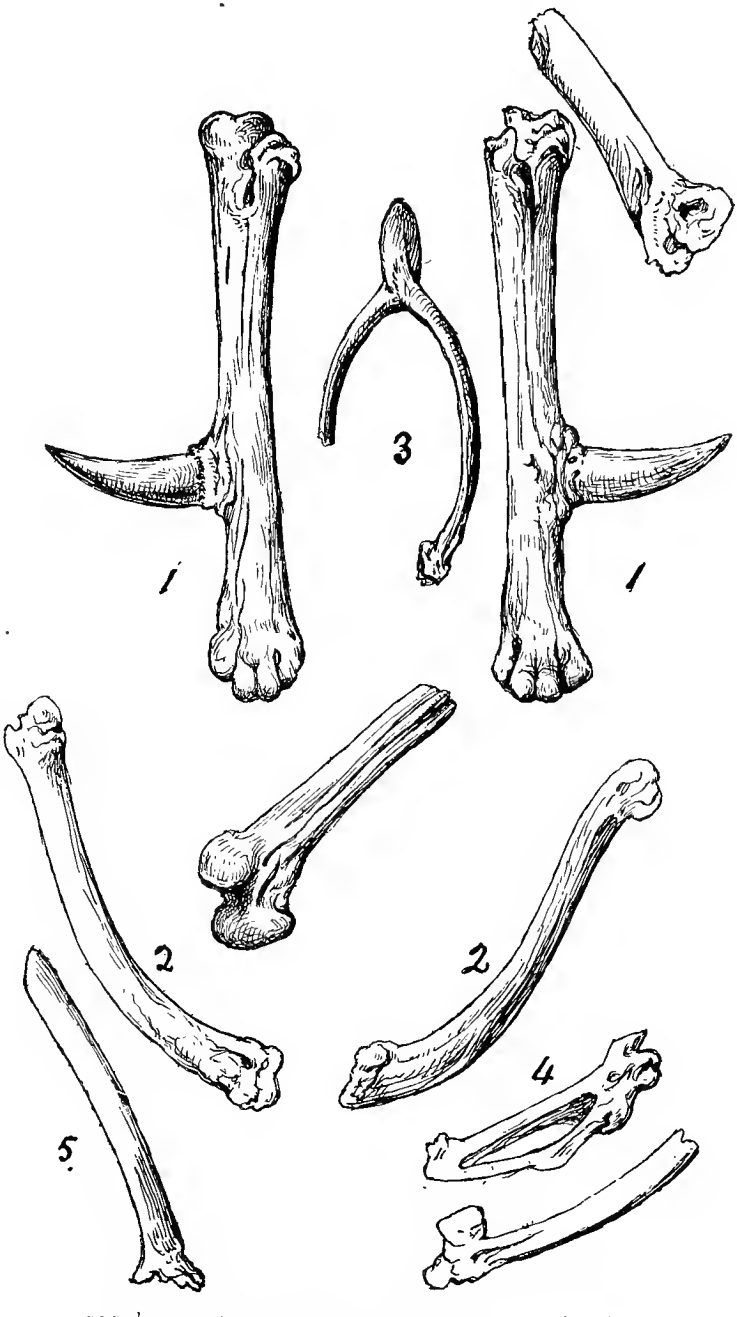
The universal diffusion of the bird is also surprising. Mr. Lesson asks if it is not remarkable to find the domestic hen, differing in nothing from that of other countries, in all the islands of the South Sea and among people with whom Europeans have certainly never communicated. Cocks and hens, he tells us, were very common at Qualan, for example, though the natives were ignorant of the fact that they were good to eat. They may have obtained them from some other nation with whom they had held communication.

Take Cornwall, in England, as an instance. It is said that the poultry bred and grown there, more particularly Game-fowl, were all of a white-legged breed, and that until of late years such a thing as a yellow-legged bird was not to be seen. Another curious fact is that the hens were mostly "spurred" like the cocks, as are many of the five-toed hens of Kent, Sussex, and Surrey farm fowls to this day. Those in Cornwall, called "the Persian bird," may possibly have been brought by the Phenicians, and perhaps bartered for tin and other metals from the mines. However this may be, there are plenty of the white-legged breed still to be found in Cornwall, though, as John Harris, of Liskeard, informed Mr. Weir, now that the yellow-legged fowls have been imported breeders are not so particular, but at one time they would not have been tolerated.

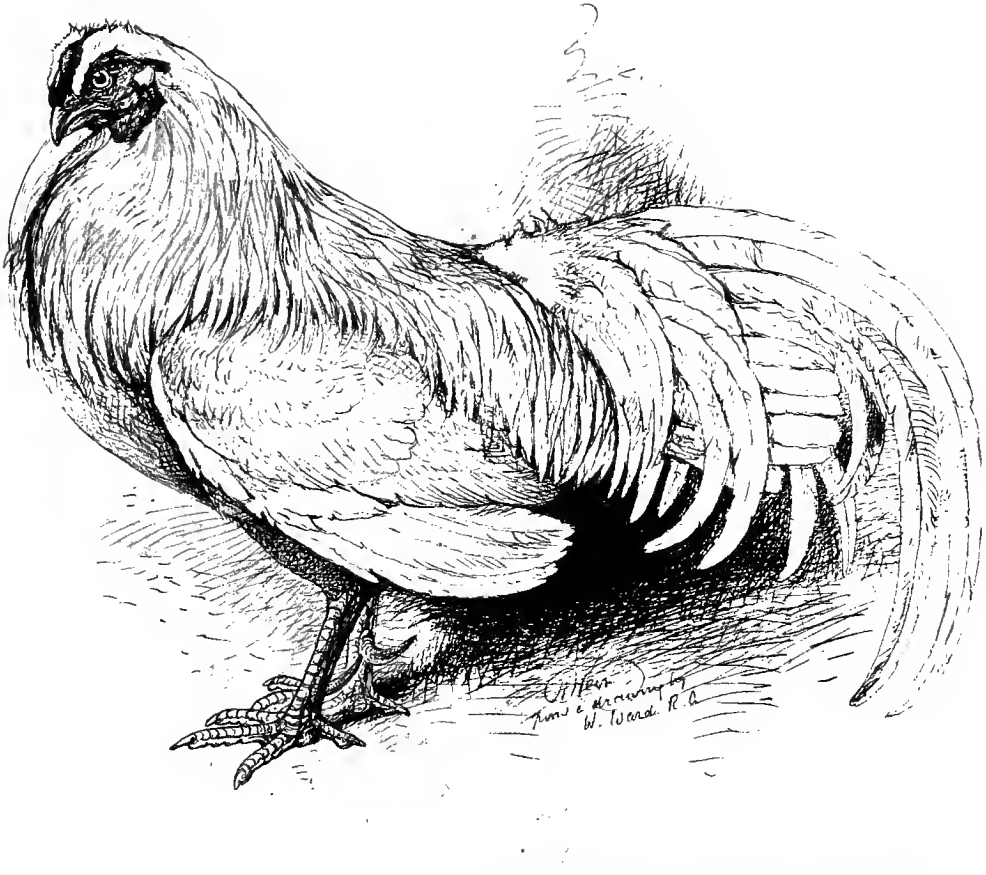
That the Greeks used artificial spurs, like the English at present, is denied by Pegge, though the contrary seems to be proved by a passage of Aristophanes. They were said to have used a cap on the spurs called a telum.* As the English are supposed to have procured the best fighting

* See drawing of the silver spur discovered in Cornwall.

cocks from other countries, and sometimes from Germany through Hamburg, the Greeks in like manner obtained foreign Game-cocks for the same purpose, the most celebrated breeds being mentioned by Columella, VIII. 2; Pliny, X. 21; Geofron, XVI. 3, 30. Varro mentions the birds most sought after in Greece, but adds that though they might have been good for fighting they were not fit for breeding, but gives no reasons for this latter statement. Had the breeding of Game-cocks been an



COCK'S BONES FOUND IN A ROMAN URN AT LEWES, BY DR. GIDEON MANTELL, IN 1814



From a drawing by Harrison Weir, after a picture by W. Ward, R.A.

OLD WHITE GAME

The old Cholmondely white cock, The Ghost. Winner of many mains. He was twenty years old when the picture was painted, and still mated to hens

employment, he would have spoken of it in a different manner. Columella also ridicules the breeding of these cocks as a Grecian custom, and prefers the native race to all others. Eustathius remarks that the Romans preferred quails to Game-cocks. It has been stated that the Roman Emperor put one of his subjects to death for killing a quail that had been victorious in combat.

Since the time of the Romans in England the earliest mention of cock-fighting is that by William Fitz-Stephens, who lived in the reign of Henry

II., and died in 1191; this reference is also quoted by Stow in his "History of London." Cock-fighting was put down as unlawful in the reign of Edward III., and again during the reign of Henry VIII., in 1569, although this king built a cockpit in Whitehall. It was again a popular sport in the reign of Elizabeth; and though Roger Ascham wrote against it,* he is said to have loved it at last. James I. is said to have been so entertained at least twice a week; and his son, Prince Henry, had a stud of his own, there being an entry in his household expenditure to that effect. In the town archives of Lincoln there is on record that during the visit of James I. to the town, "at the Sign of the George, 1617, on Wednesday, he made merry at a cock-fight." It was forbidden again by Act of Parliament during the time of Oliver Cromwell; though, judging from the copy of the act or proclamation, it was not suppressed on account of any cruelty, but as a gathering together of disorderly persons.

During the reign of Charles II. it was again revived, and was a very favorite sport of the "Merry Monarch"; so much so, it is stated, that on more than one occasion at Newmarket the horse-racing was postponed for some hours until the mains of the cock-fighting had been fought out.

Charles II. is said to have invented, or rather brought into notice, the Red Pile cocks. But they most likely existed long before, as they are mentioned in Gervase Markham's book, which was published many years previous to the reign of Charles II. From the time of the Restoration until the act passed about 1834 for its suppression the sport had not been interfered with.

In Beckmann's "History of Inventions" it is stated that "cock-fighting in France was forbidden by Order in Council, A. D. 1260, on account of some mischief to which it had given rise." Though at the present time, I believe, there is a law against it in that country, it is still carried on, as, also, it is in Spain.

Whatever may be or has been said for or against cock-fighting, it is certain that to it we owe—at least in a great measure, if not entirely—the preservation of a most extraordinary breed of fowls, peculiar and remarkable in every way, besides being of great value from a culinary point of view.

Writing of a certain breed or strain of Game-fowl some time ago, Mr.

* Mr. Weir says: "I have never seen a copy of this book, nor can I learn anything about it, further than one old English 'cocker' saying that he had seen a copy."

Weir urged its claims to public and general recognition in the following words: "Fine in form, graceful in carriage, beautiful in color, small in bone, with white shanks, feet, and toe nails, plenty of white flesh of unsurpassable quality, skin thin and white, fat white, with an absence of offal to a remarkable degree, good layers of delicately colored delicious eggs; while both the young and old birds seek their living far and wide." And to this may be added a courage strong, high, and enduring. Such were, and I trust are, "the Derby Reds." Yet these are but one type, and are proof to us of the present day of the care, consideration, thought and judgment in the selection for breeding purposes that ever actuated our forefathers to produce the highest excellence attainable in "cocks of the Game."

The very fact of their training and being fought demonstrates without doubt the survival of the strongest, the most hardy, healthy, best formed, and, in short, to use Darwin's words, "the survival of the fittest." Indeed, had cock-fighting as a sport never existed, it can scarcely be doubted that such birds as we now write about would be in evidence. Thus our poultry-yards would not have been graced, as they now are, with a bird as useful to man as it is preëminently beautiful.

What other bird has the stately walk, the symmetrical form, the bold alertness, the daring, haughty look, the graceful pose and carriage? "Where is there one so agile? Where another so rich in colors?" or of more befitting texture of "plume"? Erect, bold as a chief from battle with glory crowned a natural ruler—a bird without a peer! And this because from generation to generation and century to century the best, strongest, healthiest, truest, and of the purest breed have been kept, while the weak and ill-formed or ill-conditioned were set aside. "I have found," says Mr. Weir, "that tuft as often means a fleshy comb as feathers."

For a clear and accurate enumeration of the points of excellence the Game-cock of the present century should possess, we are much indebted to the well-known veteran, John Harris, of Liskeard, Cornwall, whose knowledge is indeed great of the breed "that has braved a thousand years the battle and the breeze." We quote his description of the points of the English Game-cock: "The beak big, boxing,* crooked, pointed, and hawklike; eye bold, fiery, large, fearless; head small and tapering; throat and face very loose and flexible; neck large-boned, round and strong; back short, broad at the shoulders, and tapering to the tail; breast broad,

* The upper mandible shutting close over the lower.

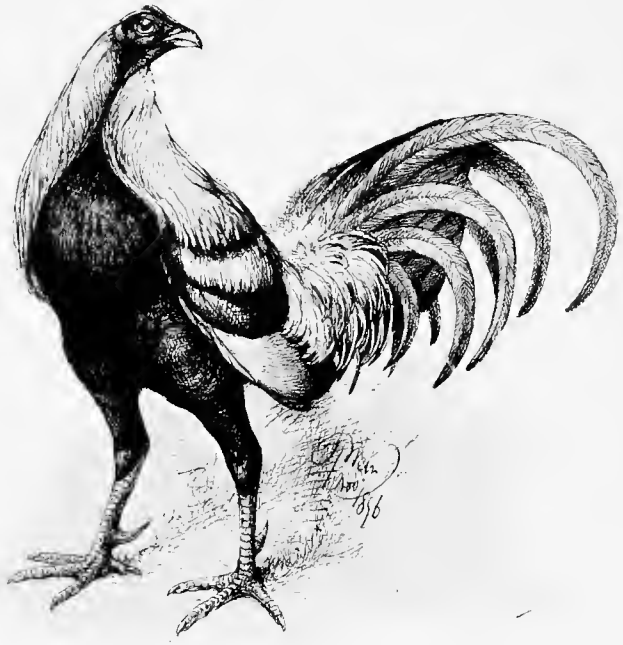
full and prominent, with well-developed pectoral muscles to give the necessary action, power, and force to the wings. Breadth and fulness of breast are most essential to Game-fowls, whether regarded from a sporting or edible point of view. In a table fowl it is indispensable." Mr. Weir's "Derby

BLACK-BREASTED LIGHT RED PRIZE OLD ENGLISH GAME
Bred and owned by Mr. Weir

Reds," after coming to the yard to feed, nearly always used to take wing and fly across a two-acre field into an adjoining wood, thus proving their strength of flight.

Mr. Harris maintains that "the wings should be large and long, with the quills strong and of a powerful description, so as to impart additional force in action; tail large, up and spread. The up-spread tail is indicative

of spirit and of high courage." And yet he says "we frequently read of tail too high. Whoever saw a Game-cock's tail 'too high'? A low, drooping tail is a sign of weakness and constitutional debility."



BLACK-BREASTED SILVER DUCKWING

There is a growing propensity among some of those acting as judges at shows of calling all fowls carrying their tails high, as in many breeds they should, "squirrel-tailed." Nothing, in the opinion of Mr. Weir, in many cases shows more want of character than "a drooping tail"; we are glad to find so ardent an old fancier as Mr. Harris agree with Mr. Weir. But to resume Mr. Harris's description of the Game-fowl: "Belly small and tight; thighs very short, round, and muscular, not 'straddling,' but the thigh crooked or bent, following the line of the cone-round breast; this would make the cock as he stands close-heeled. No one with knowledge of the true Game shape would approve of a cock standing with his legs wide apart.* Legs strong, clean-boned, and not at all gummy like some other fowls, or stiffly upright, having small spurs set very low down, and having a good bend or angle at the hock; color black for black reds, whitey yellow, or carp for other black-breasted reds." This bend of the hock—or, more correctly, the junction of the metatarsal bone with the tibia—may aptly be compared to the bent hocks and muscular thighs of the hare or kangaroo, as

* How true this is the practical Cocker knows, but of which so many modern writers are lamentably ignorant, yet, assuming a knowledge they do not possess, they too often advance a fault as a point of excellence.

furnishing them with such wonderful propelling power. In cocks of this perfect conformation there is nothing wasted in these individual bones, which are constructed so as to enable all to move with velocity exactly commensurate to their distances from the center of action. "Feet flat, thin, with long taper nails; in hand evenly balanced, what 'cockers' term 'clever'; firm, but corkey and light-fleshed, mellow and warm, with strong contraction of the legs and wings to the body."

A finer description of a Game-cock could not well be made; every touch shows a master hand.

Mr. Sketchley, in *The Cocker*, puts the most serious defects as—

Flat-sided and thin generally, deep keeled,	Thin thighs,
Short legged,	Crooked or indented breasts,
Short, thin neck,	Duck- and short-footed,
Imperfect eye,	Unhealthful,

which may easily be seen when "up" for the purpose of handling. Mr. Sketchley further says: "Cocks that do not bear conelike shapes are for the most part straddling in their walk, and as they walk they fly; whereas in the cone shape the legs are more inverted and narrow." These remarks do not agree with those laid down as "the points" of beauty to be attained in the modern Game, though manifestly better.

Mr. Robert Howlet said on the title page of his book (1709), "That the sport is both ancient and honorable." He divides the breed into two classes, the "Game-cock" and "match cock." We do not find any writer before his time so observant or so careful in distinguishing the varieties of size and form.

"Having furnished yourself with a breed that is stout and sure, see then to the shape, and know that here you ought to be very nice and circumspect, strictly examining every part; and if by severest scrutiny you find the cock to be foul-grown or disproportioned, reject him as a bird unfit to breed from, and consequently unworthy of your care or least regard, notwithstanding the stock be ever so good from which he is derived."

After describing the shape, which is almost identical with that given by Gervase Markham at a much earlier date, he proceeds: "As to the color of your cock, that is best which you fancy most—black, white, red, dun, gray, or piled, or any other color whatever; for, though Captain Markham makes a great difference in the color of the cocks, there is nothing

in it, for the world affords no better birds for the Game than many of your duns and white prove.

"'The scarlet-colored cock my Lord likes best,
The next to him the gray with the thresle (thrush's)* breast,
This knight is for the pile, or else the black,
A third cries, "No cock like dun with yellow back,"
The milk-white cock with golden legs and bill,
Or else the cuckoo, choose you which you will.
. . . . . .
But this all mere fancy is, and no more,
The color's nothing, as I said before.'

"And, therefore, without taking any notice of color, I shall only hold you close to the aforementioned shape, as being 'the all and only part necessary to make up a complete cock.'" Yet in many cases the old Game men prided themselves on the colors and uniformity of their studs; still, with such a full and excellent description as just given, no breeder of "the Game" can be at a loss as to which is the old English Game, and having the high qualities of shape, if not possibly color.

Howlet continues: "Having obtained a cock that is hard, sharp-heeled, and handsome shape, it remains then for you to pitch upon a fit size for your purpose, otherwise you will still be at a loss. Now, though there are as many different sizes as there are several cocks" (which difference in size is often produced by the early feeding, as Mr. Richard Stamp has fully demonstrated), "yet are these birds reduced to two sizes only, and distinguished by these two general terms—that is to say, the great Game-cock or "Shake-bag," and the little match cock or "battle cock," which last is now called "the old English Game."

The Giant or Herculean was called the Shake-bag by the English and Dutch; by the Indians it was known as Mag Chantille Champone, and Mag-Gal by the Scotch. Baden assures us the word signifies great or mighty. Doctor Wilde, writing in the seventeenth century, gives the reason why they are called shake-bags: "Here in England," says he, "they are so termed from a Scottish custom, and that 'the Dutchmen have, who are great admirers of large cocks, and these being fought at a venture,' the bags in which the birds are being taken by the bottom, they shake the cock out at the mouth upon the pit, from which custom they are called 'shake-bags.'" In some parts, as in Kent and Sussex, where a bag

* A throstle (local).

is often called a "poke," they are called "turn pokes," and "turn-out" in other places.

These large Shake-bags were not only well known but plentiful previous to the year 1709, at which date Mr. Howlet's book appeared, though Mr. John Laurence (Mowbray), writing more than one hundred years later (1815), speaks of them as rare and only kept by the Duke of Leeds. He says: "Shake-bags, formerly the largest variety, has in all probability been entirely worn out for some years. It was called the Duke of

BLACK-BREASTED GINGER RED, EIGHT MONTHS' COCKEREL
Owned by Harrison Weir

Leeds's breed, His Grace, more than fifty years since, being a great amateur breeder of them"; but it does not appear whether His Grace first raised the variety, or whether it arose merely from improving the size of the common Game or the "dunghill kind," or from any foreign cross. The former is the most probable conjecture, on account of the whiteness and fineness of the flesh in the genuine Shake-bag. "The only one I ever possessed was a red, in 1784, weighing about ten pounds." At that period the real Duke of Leeds's breed had become very scarce, which induced dealers to put Shake-bag cocks to Malay hens, by that means keeping up the original standard size, but entirely ruining the color and delicate flavor of the flesh.

Mr. Harris remembers the Duke of Leeds's breed, as it was called, all of which he says had much of the unmistakable Malay stamp about them; but, according to the statements of old men, especially Smytherum, who fed for Lord Rodney, and Bidgood, feeder to Admiral Duckworth, the original breed of "the Leeds" Shake-bags had pure white legs, with the flesh and skin as white and delicate as any Game-fowl, though some had carp legs and colored skin, which showed evident traces of Eastern blood.

We have given these descriptions at length, for many writers of poultry books of the present day quote Mowbray, often without any knowledge of the word or meaning of the name "shake-bag," some authors even spelling it "shakbacks."

Mr. Weir remembers that very large Game-fowls were kept by some of the Kent and Sussex farmers and landholders, mostly, if not all, with white shanks, though a few were dark or deep yellow, according to plume. The duckwing Game-cock in Herring's picture of "Feeding the Horse" was painted from a very heavy bird he knew well. It was fully nine pounds or more in weight. Yet possibly the original very large birds might have come from the Low Countries, for they are still plentiful not only on the Continent, but also in England, Scotland and India. There is an opinion existing among cockers, from the mode of attack and general demeanor in the pit, that they have much of the Malay blood in their composition, as previously stated.

Centuries ago the lesser Game-cock, as now, was preferred. The little cock, as is well known, is full of dash, activity and courage, while the old Shake-bag was slow and cruel. All this tends to show that at least some of the ancestors of the Shake-bag were Chittagongs or Malays.

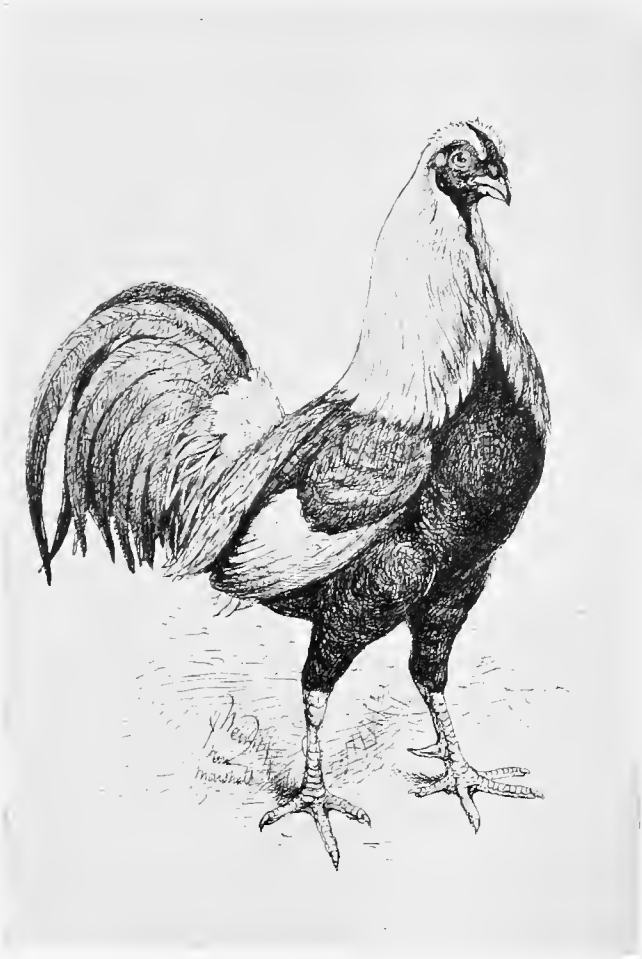
This is but the usual effect in breeding for size; most, if not all, large fowls are longer in attaining their full growth or in "filling out" to what will be their more permanent bulk. It is so with geese and ducks of the "improved" varieties, these last seldom attaining their full form under the second year, whereas the goose of three years is not as big as it will possibly attain. We are disposed to think that those of the Duke of Leeds were only the ordinary farm Game-fowl bred to a large size by ample feeding and selection. Others are of the opinion there was much of the Malay blood infused to obtain the larger growth. Looking back at the old prints of the Malay, we find them delineated as large, upright birds, with by no means small tails, and very different to the form in which they are now bred. Even in India there are varieties, which causes us to inquire "Is the Malay a breed or a family?"

UNDUBBED BLACK-BREASTED GINGER-RED OLD DERBY
Bred at Weirleigh by Mr. Weir

Breeding Game-Cocks

Regarding the breeding of the Game-cock, Howlet says: "First, know that the cock from which you intend to breed is a bird well descended, rightly shaped; he must be healthful, fresh, and full of feather."

Referring to the Game hen, the same author says: "She must be either the mother or sister of some admirable cocks known to signalize their valor in the field of honor, and not only they, but their progenitors. She must be rightly shaped, healthful, fresh, and full of feather; her age ought to be different from that of the cock; if the hen is old then the cock must be young; but if the cock is old the hen should be young."



GAME
After a drawing by Marshall—1790

It must be borne in mind that this was written in the days of the pit. It will be observed that, though Howlet was an experienced and thoughtful breeder, his mode differs from others. His observations, as well as those of a later date, have been quoted here to show what care and exactitude in all details our old Game-cock masters endeavored to excel in the production of the most healthful, strongest, and best fowls. To this excellence the breeder of the present day has scarcely progressed. It may be doubted whether we have better or even as good fowls as the breeders of more than a century ago.

The Sportsman, 1797–98, says: "Be certain the hens from which you

intend to breed are sound. Use the same methods as those for the cock. Be assured that there has not been a taint in their race for many generations. The breeding place should be at least half a mile from where dunghill fowls are kept. In February, put the cock and hens together. If a cock disagrees with a hen, take her up. Breeders differ much as to the food given to chickens the first ten or twelve days; they grow best when fed with bread and egg mixed, as for young canary birds. If the weather is wet and you are obliged to keep them in a room, give them bones of raw mutton or beef to pick once a day. When a fortnight old, begin feeding barley, wheat and oats, and see that they have gravel."

Early feeding with barley or hard food of any kind is, in Mr. Weir's opinion, wrong. Soft food of various kinds is the proper feed, he thinks, until the chicks have passed their first feathering at least, and even then it is best to be sparing of hard grain unless well crushed or broken.

"See that the perches are round, and not thicker than the fowls can grasp. When they are flat or large, as some advise, it tends to distort the feet, the outer toe often twisting. If they can grip the perch, the foot is seldom deformed. Put the perches high to make them fly, but not too high. Have the floor soft." Mr. Weir says he uses pine sawdust at least six inches thick on the floors of his houses.

As to the perches, the old breeders had somewhat different opinions, but mostly the approved perch was low, seldom more than two feet from the ground. High perches and hard soil for the chickens or fowls often produces lameness, crooked breasts, and other deformities.

Speaking of inbreeding, Howlet says: "By no means let them be too near of kin. Out of brother and sister, or father and daughter, seldom or never good cocks are bred. They either prove thin, weak and ill-shaped, or else dull and false-heeled—especially if they are great cocks, for one must be much more cautious in breeding them than the little match cock." Howlet's opinion, however, does not agree with the views of Mr. Sketchley and Richard Stamp. The latter, one of the very best breeders of his day, advises breeding "in-kin" thus: "In all cases the hen bird should be the oldest, mother and son, aunt and nephew, half-brother and sister, cousins and half-cousins, grandmother and grandson, and the more crosses in that way the better." John Harris, in his description of the method of breeding adopted by the most celebrated cockers, states that "the breeding-walks generally contain six hens, full-blooded sisters, with one stag cock,

so that the produce would be full-blooded 'brothers or sisters.'" Mr. Stamp further says: "I have many a time thus bred seven to ten crosses, and by so doing the cross appears like fresh blood in the strain. I have bred from a hen fourteen years of age and got good feather, size and weight, appearing just like the former type. I bred from a hen ten

BLACK-BREASTED RED GAME COCK, 1807
From Ree's "Cyclopædia"

years of age, and got some good birds, one winning four mains and another seven."

Like most men of his type, Mr. Stamp was full of observation. In one of his notes he says: "I have reared birds to as far as eight or nine pounds in weight by following them up with nourishing food," but he adds that they did not improve by that means, showing that selection and matching was the surest method. He further states: "By doing so

I got weight, but no more strength, and lost a good deal of action. When I reared a bird on natural food up to six pounds, good size to weight, and good type, I could match him against any bird any size in the world." This from such an authority carries conviction, and is worthy of all consideration. He also notes that strong-boned birds generally grew thicker and longer spurs. We suppose by this he means close-textured bone, and by no means "spongy." If so, this would most likely be the case, the spurs themselves would be of a finer texture and less liable to get broken off. It will likewise be seen from the above that, although Mr. Stamp bred closely "in-and-in," he not only maintained great stamina in his birds, but could also gain size as well, when he wished to do so, adding several pounds weight simply by selection and feeding; yet we are told that crossing out is absolutely necessary to obtain size, and "in-and-in" breeding reduces it. Failure possibly attends those who are ignorant of methods, whether of "in-and-in" breeding or of crossing out.

But as doctors differ, so does "the Fancy," even on the question of breeding "in-and-in." Mr. Sketchley says, writing in 1814: "To promote the means of keeping these fowls in their wonted health and valuable acquisitions, if you are in possession of stags and pullets, as well as cocks and hens, select the blooming of both, and put stags to the two-year-old hens, and cocks to the pullets, and you may for years continue in the same blood, observing to put them invariably together in the above-recited manner, never on any account making use of either cock or hen after their being two years old; for by adhering rigidly to present youth to youth you can scarcely fail of success." Here is a decided difference of opinion as to never breeding from an old bird, and yet both show equally good results. Mr. Sketchley deprecates most conclusively the breeding from old birds over two years, while Mr. Stamp proves the contrary—that when necessary for the purpose of retaining certain blood it may be adopted with success. The former speaks of several sisters running with one cock, but then he points out that all must be of full and robust health, and watched as to any deterioration in this respect, and the cock must have and retain—

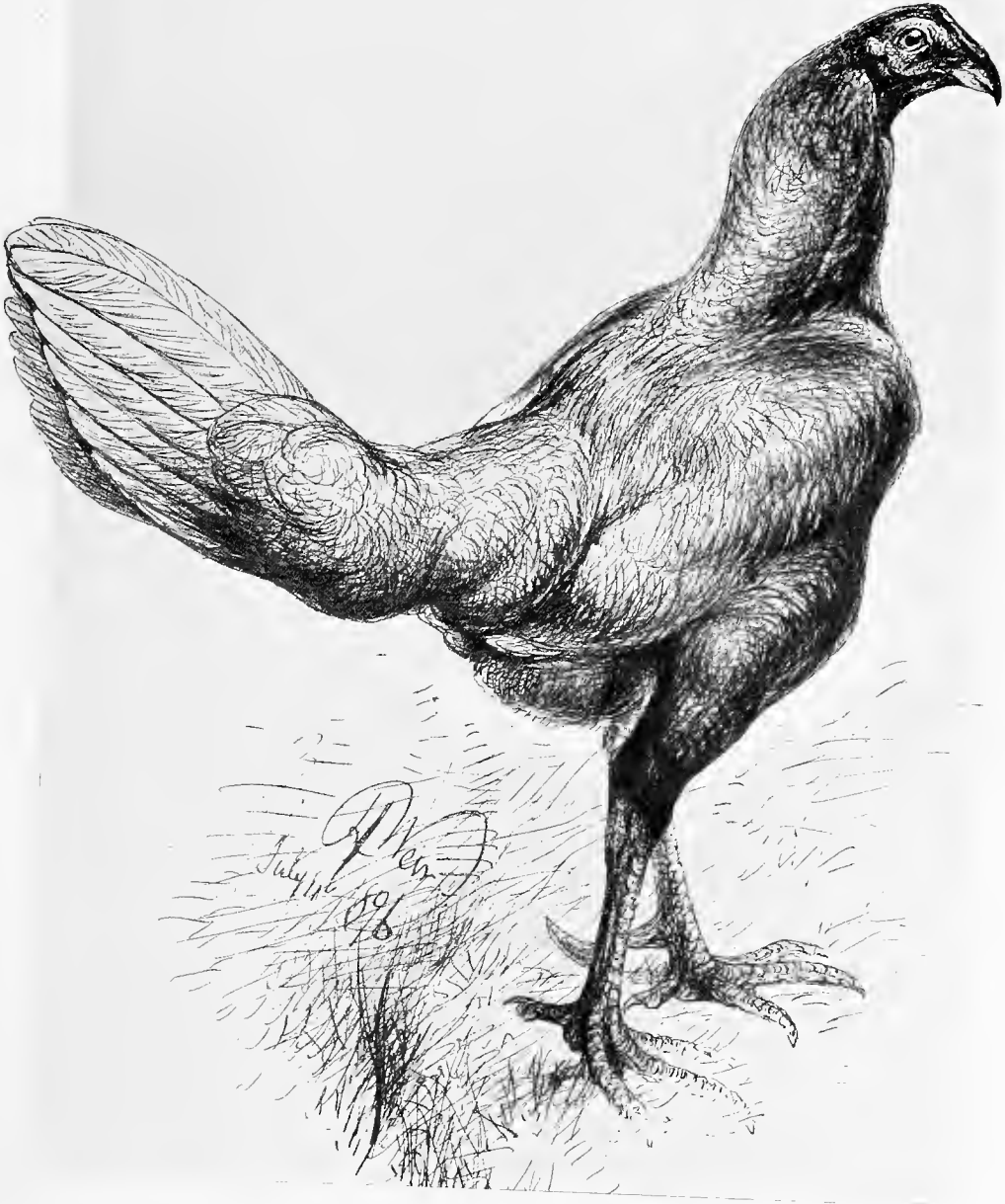
> "The standard ruddy bloom of health,
> That his feathers are not dry or loose,
> But mellow in feel, bright and firm;
> His flesh firm and compact;
> His legs well under him, and his crow clear and sound."

Then all ought to go well, and the progeny be strong and hearty; but if the breed fails, though bred from sisters in health with a cock in good health, simply from deterioration in some way, he says "that a cross away is never necessary, but frequently robs them of some rare qualifications they had formerly enjoyed. A general failure wants no cross, but total eradication."

However, "in-and-in" breeding is by no means of modern date, but was practised centuries ago. Judiciously managed, it is the most ready method of securing any particular type. As Richard Stamp and Mr. Sketchley clearly demonstrate, "when in master hands" it does not in any way weaken or injure the constitutional strength of the birds so bred. Our forefathers knew this, and it also appears to have been their practice.

This mode for the perpetuation of certain qualities was continued by the later cock masters. It was adopted by such men as Doctor Bellyse, who was considered one of the best breeders of the old fighting strain of Game-cocks. He was celebrated far and wide as the owner of some wonderful piles.

John Harris remarks: "There were the renowned in-and-in bred, mealy grays of Hugo Maynell's and Sir Charles Sedley's, which beat everything that could be pitted against them in their day." Particular attention is called to the fact of these strong and valorous birds being bred "in-and-in" as they were, yet possessing such wonderful vigor and constitution which they by demonstration clearly showed themselves to possess. This goes a long way to prove an assertion Mr. Weir often made and maintains, that the mode of "in-and-in" breeding, if properly understood and used with care and judgment, is one, if not the very best, method of perfecting any desired quality, form or color, retaining it without deterioration of the constitution. Mr. Harris says in his remarks: "Until crossed out after the decease of their masters, so powerful were they that even the 'killing smocks' (white) and 'light pyles' of the Warburtons, Raylences, Molyneuxs, and Egertons, whose heels were wont to bring down death suddenly, could not live a battle through with them"; and only when those black-legged warriors of Maynell and Sedley were opposed to each other did either find their equal. By this same system of breeding Maynell produced the most perfect pack of foxhounds the world had ever seen. We again wish to impress this method for attaining perfection thoroughly on the notice of all breeders of stock, also bearing in mind the fact which should



BLACK HENNY OLD ENGLISH GAME
Owned by Mr. Weir

never be lost sight of—it requires a good eye for properties, a keen and experienced judgment, and a more than ordinary development of natural talent and aptitude for matching only those birds that are likely to produce in excess those properties which are lacking in those to which they are mated; thus it is that more points are gained tending toward perfection, and with more certainty of a good and even result. We have purposely quoted their prowess to show that they neither wanted vigor nor courage. Mr. Harris informs me that Stamp bred for seventy years with two crosses, Bellyse more than fifty years, only going back to the original on two or three occasions. The crosses in the Derbys from Lord Germain, the Whitworth "Doctor's," and one or two others were the only ones used up to the death of "the old Earl," from the time when Lord Strange first made them. He also adds that if he wished for first-rate qualities, "I should take a cock from a strain I had sixty years ago, although I have had such strains for crossing as Bourne's, Weightman's, Baily's, Brough's, Callicote's, Daughberry's, Rendleson's, and many others."

HEAD OF OLD ENGLISH GAME COCK WHICH WON A WELSH MAIN

Writing some years ago, John Harris says: "I have just seen one, if not the very last, of the pure-bred Parkhouses (Tassels) on a brood walk, where he has got fine chickens this season, although he is from fifteen to twenty years old, and is a true and good type of the breed, having a long, narrow tassel." Another proof of stamina in a breed was in that of Mr. Morris's well-known "grays," one of which, after winning in eleven mains, had thirty-six sons fight in a main at the Royal pit, and only four of them were beaten.

At the present day, most of our fowls are considered old and past usefulness when about four, five or six years of age, and this with all the modern methods of crossing "out" and recrossing "out." We have purposely mentioned the birds of "the pit" as showing that there was no loss or any deficiency of courage unless they were crossed out.

After reading Mr. Darwin's remarks on the "in-and-in" breeding of poultry, it appears that he was by no means sufficiently supplied with the actual facts of Game-cock breeding, nor of their condition after a continuous course of many years of "close interbreeding," with, we may almost say, scientific selections; but in this, as in other cases, he had to, and did, rely on the knowledge of others, who possibly were not themselves sufficiently well informed, or rejected much that did not assimilate with their views on interbreeding. We are fully aware that some men have such preconceived opinions as to believe in no proof, nor in any one but themselves. Of course, it requires much judgment and attention to pedigree to breed "in-and-in" with success, and it is considered almost necessary to have walks on different soils, and, if possible, wide apart or even in different counties, good soil and environments—all being of value, each in their degree.

With all care we can never be positively certain in what proportions the desired combination may be brought about; the advantages to be gained by cross breeding fowls appears to present so great a hazard of injuring pure breeds that few beyond those to whom the test of experiment is sufficient to interest will be likely to take shares in the lottery.

The introduction of a "pile" Game-fowl into a strain of black-breasted Reds is said to have made its appearance after a lapse of fifteen years, when, moreover, for many generations not a symptom of it had been apparent. This is but one case; several have come under my own observation. But further, the editor remarks: "All we contend for, as in other crosses between the different breeds of fowls, amounts to this: that it cannot be said that such produce generally will exhibit in form, feather, or properties any very near approach to the proportion of the parents' features to which their origin would entitle them."

One of my points is the first cross, which it is said should be half of each parent, shows often so strong evidence of the one that the other part of the cross is scarcely perceptible; and when this is the case it as often again shows itself, though it is supposed to have been "bred out."

An instance of this is to be found in the old Derby Reds; these were kept intact for very many years (it is said a century), when, about ten or fifteen years before the Earl's death (1835), they were crossed with the "toady-breasted" grays, with which he fought many battles latterly, and these frequently produced wheaten hens; before this they were unknown in the stud.

Mr. Sketchley so strongly deprecates a slovenly way of matching for breeding "incongruous colorings" with, in his estimation, most pernicious results. He says: "A regular, well-chosen system to breed uniformly not only in feather but in each character respectively is the best mark and criterion of an experienced breeder." (That is so, doubtless, and any one that decries color as not being a "part and parcel" of the life and constitution of a bird has, I think, yet something to learn besides the lack of uniformity in the "livery.") "When a main exhibits a regular set of brothers that require minute discrimination to distinguish one from the other, it meets with the general plaudits of the surrounding pit."

GAME DE BRUGES (SHAKE-BAG)

The art of breeding true in color, in plume, shanks and feet seems to rest with very few, judging from what poultry shows give us as types. Take the Derby Reds as an example. So ignorant are the breeders of the present day of the method adopted by the Earl of Derby that these fine old servitors are fast losing their identity as "reds" and becoming mere splashes and pieds, these sometimes miscalled spangle, and often even with discolored shanks and feet. And in the richer, brighter, light-colored forms the lamentable falling off in the last quality is most grievously observable and deeply regrettable. This comes, undoubtedly, from the want of knowledge, not only of how to match, but only too often from the outside remedy being tried in the way of an alliance with some other breed or strain, the Derby "light reds" having been got originally from piles (Smock-breasted reds) and the old black-breasted black reds, and so bred and selected until the black under-color was bred out and a white substituted. This white "splashing," therefore, is merely atavism of color, and in some localities disappears, while in others the white is so aggressively persistent as to become the ruling color; but one curious fact, noticeable throughout, is that although it may be said the color is weakened, yet neither the strength, health, vigor nor courage is in any way impaired.

CAPTAIN HORNBY'S BLACK-BREASTED LIGHT RED DERBY GAME-COCK

From an old pencil drawing, 1853

And, further, it has been stated that none of the old warrior strain

were without some white; this may be the case generally, but not with all. Having kept the breed for many years, it was seldom Mr. Weir could breed either a cockerel or pullet whole colored, though the latter were less difficult to produce; yet sometimes he was successful.

Of all colors, the most attractive is the black-breasted, dark, blood-red, with pure white shanks, feet and beak; being at once not only the most beautiful, but also the most useful for all purposes, the yellow shanks in England being objected to for table.

In some cases the white in the Derby Reds is so much in evidence as to make it a white bird, somewhat lightly splashed with red, purple and black, in variegation more like a tulip than a fowl. Such splashed birds are too often miscalled spangles, a real spangle having a colored ground, each feather being tipped only with white. There are red, brown, yellow, blue, dun and black spangles. (A spangle is foul in feather that has nearly or wholly white or black feathers in the tail or wing primaries and secondaries; yet such are erroneously given precedence by the modern so-called Game judge over black-breasted reds pure in color, and so with black-breasted, silver and other duckwings.)

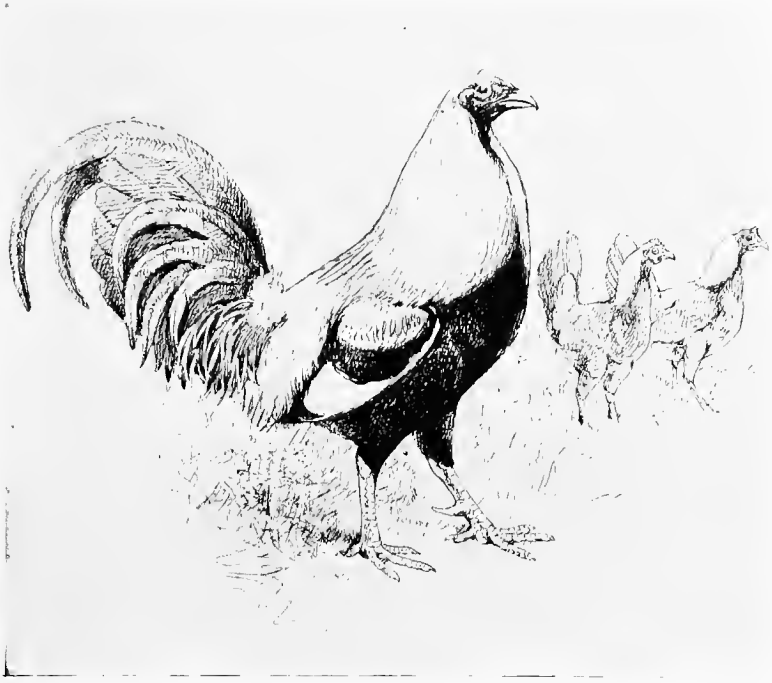
The Cornish light reds were an offshoot of the Earl of Derby's and Mr. Taylor's strain, which were one and the same family. Coath kept these birds carefully bred, and was very successful for upward of forty years, until he crossed them to gain bone with those of more sturdy make, when they were just as unsuccessful in the pit as "they proved good before"—another instance of the value of "in-and-in" breeding; and here is one more:

The Earl of Derby's strain had been bred at Knowsley for many and many a long year; some aver for much more than a century. They were a beautiful strain, though a few of the old fanciers objected to their dun or daw eyes. Beesley was His Lordship's first feeder; on his decease, Potter took office, followed by Potter, junior. For a great number of years His Lordship's breeder was Roscoe; and who does not remember the son, "Thomas," that next took charge of the Knowsley stud? And "what a stud!" For a number of years he placed out more than three thousand chickens annually, and from these it was an easy matter indeed to pick out many and many a faultless bird, fine in color, good in shape and constitution. Well do I remember the grand, the noble and stately appearance of these beautiful "flame-black and purple" colored birds, as they walked and

crowed among their hens amid the bracken of the old deer park, with a dauntless mien and a majestic carriage, well poised on their ivory, stainless shanks, their jetty breasts, their large, full-feathered flowing tails, some few having a white feather or two or a half-white sickle, others "without this blemish" of color, though perhaps "blanched winged." The stag was perfect in all ways, without a streak of white, as were the partridge-colored hens.

Those most preferred in bygone times were: (1) Black-breasted black reds; (2) black-breasted reds; (3) black-breasted Birchen duckwings; (4) brown-breasted Berry Birchens; (5) piles (these really should be designated "white-breasted reds," or yellows, duns, blacks or blues, as the capping might be); (6) black-breasted silver grays; (7) white or smocks; shaded-breasted mealy grays; (8) black-breasted dark grays; (9) ginger-breasted reds; (10) black; (11) brass-backed blacks; (12) spangles; (13) smock or clear whites; (14) duns and blues. Although some were esteemed more than others in different localities, their merits were pretty generally admitted in the order named. This being so, then it would seem there was something in color after all, there being better cocks for "the pit" of the darker colors than mostly of the lighter; and it appears to be so thought by universal consent, although "the smocks" in their times have borne themselves in a true and knightly way, and the red-and-white liveried piles have maintained and upheld the honor of royalty.

After the black-breasted black-reds few if any of the old English Game-cocks stood so well in the opinion of the many, or were more daring, more full of life and vigor, or had a more fearless, haughty carriage than the blacks, the very blacks—"Satans" or "Demons." Fine upstanding birds, somewhat tall, yet strong, and big in girth, fierce in look, with large, round, defiant, bright black eyes, black combs, faces, beaks, shanks, feet, and toe nails, while their plumes of black intensity, with sheen of crimson, purple, blue and green, as they moved in quick or deliberate motion, caught the sun's rays and flickered and flashed in varied hues, as though the very color lived. Full-tailed and big-winged, which they clapped, then crowed, stopped, gazed and crowed, they were of the Game-birds once seen never to be forgotten; but they are past, and other colors and forms are now the vogue; and so with the azure-breasted blues, lovely in color, bright and beautiful, and their congeners, the blue duns, with their mellow-toned and softened, tinted feathering, looking bright by contrast.



Drawn from a photograph by Harrison Weir.

OLD-STYLE GAME

Where now are the charming yellow-breasted, red-breasted and ginger-breasted reds, with their glowing, fiery-flashing colors, the robin-breasted, the old black-and-white piles, and the lovely mealy grays, with the chestnut wing bar—all these and more were "the liveries" of the dukes, lords and squires in the old times gone before us. These and such as these were of the highest type of vigor, health, strength, beauty of form and color that art, care and knowledge could possibly achieve as was maintained and evinced by some yards having this remarkable uniformity in all respects.

When cocks were entered for the pit they were weighed and described most carefully in every way, but perhaps it is not generally known that at some of the more northern pits they were also named on the match bill, of which, being interesting, I give an example:

> "Cock-match bill, to be fought at the old Galloway Pit, at Newcastle-on-Tyne, Easter Meeting, commencing April 1, 1850."

At all the matches the birds were numbered as well as named, and it is curious to note the odd and strange names given, and under which these

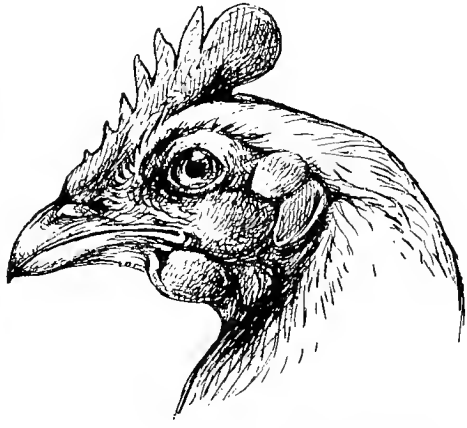
feathered warriors fought. Here are a few which may some day prove to be historical: "Gay Deceiver," "Laplander," "Blue Bonnet," "Steeple Chaser," "Lord Hill," "Bob Must Take Care of Isabella," "Kill Him, So I Will!" "Trial Is the Best Proof," "Billingham Lass" (this seems somewhat wrong for a male bird), "Tip, the Daisy," "Bella Wants Him Back Again," "Paul Jones," "Peep o' Day Boy" (this is fairly descriptive of "the early bird"), "Plodge the Burn," "Horn of the Chase," "He Is Waiting in the Village," "Robert Is a Plucked One," "Jane's My Darling," "The Bonny Pit Lad," "Free Trade," "Proud and Saucy," "Teaser," "Fair Play," "Jenny's Fancy" (this is entered as a dun pile), "Little Devil" (it is to be hoped this did not survive the combat), "Hark to Thunder," "Hark to the Lark" (does this in any way indicate the musical crow of this entry?), "Slashing Harry," "The Tout," "Beny's the Best," "White Stockings" (perhaps a white-shanked Derby Red), "Through the Wood, Laddie," "More Whisky" (this is suggestive of having at least some spirit), "Hairy Leg," "More Brandy," "Wanton Willie," and a large number of others, thus illustrating by their names the peculiar "whims and fancies" of their owners. After reading through this old cocking-bill, and the number of birds mentioned, one cannot repress a feeling of depression and extreme sadness, knowing these encounters were a matter of life and death, and they, too, in all their pride of youth and beauty, with apparently more life than the body could well contain, stately in step, haughty in carriage, and beautiful in contour and color. Yet how many of all these lovely birds were alive at the end of this seven days' meeting, where it was no doubt the lot of some to fight and fight again, and yet again, before they gained the oft-contested right of "going home," and there to end their days as brood cocks among flowery meads near rippling rills, in peaceful walks, proud of their ever-prating, cackling hens, and then with loud voice rousing the rested world to begin anew its work and daily life.

Of mains and Welsh mains nothing need be said, as what they were, and are, is so well known, but it is not so with the battle royal, which is most imperfectly understood, so many writers of fiction designating a furious fight between two as—"hereupon 'a battle royal' at once ensued," which in no way gave any idea or represented that which occurred in the days of "the cockpit"; indeed, even then it had long been in disuse, and was only resorted to when a few birds were left over, and time was pressing.

This may be so, but it is a well-known fact that such exhibitions at the most celebrated pits were conspicuous by their absence.

The battle royal was for a time a favorite mode of fighting among cockers of the lower order, who, upon the old maxim of "the more danger the more honor," became practical advocates for general destruction in the following way:

"A battle royal may consist of any number of cocks, but it is hardly ever known to exceed eight, the owner of each having made good his entry by paying the stake-money, or previously contributed his share of the prize or purse (sometimes the cocks were handicapped, great winners paying more entry money, and untried cocks or stags somewhat less). All parties being ready, the battle or fight for the prize is begun by turning out into the pit all the cocks (that are to do themselves honor) at one time; a general *melee* commences like to the old jousting times, when every knight's weapon was against that of the one next him, and every one his enemy." The scene in the cockpit can better be imagined than described. "Here, there, and everywhere birds rose and fell, the last often to rise no more—carnage at once revolting, inhuman, and disastrous to all the combatants save one, and generally not one lived till the pit was cleared. Often the gallant conqueror of birds as brave and strong as himself had barely time to scramble on to the heap of slain and crow his last crow of defiance ere sinking wounded unto death"—or, perhaps, "A scuffling, racing, tearing, crucial bandying of blows, vigorously dealt, a restless rushing from side to side, a savagery of killing without science or art of attack or defense, at times two or three springing high over the others, alighting again amid the battling throng with deadly effect as they buried their burnished weapons into the throbbing mass of contentious combatants below them. Now and again a pause, a shrill, ringing crow like a trumpet blast, and the living dash on their nearest foe, and over the heaped-up



From a drawing by Harrison Weir

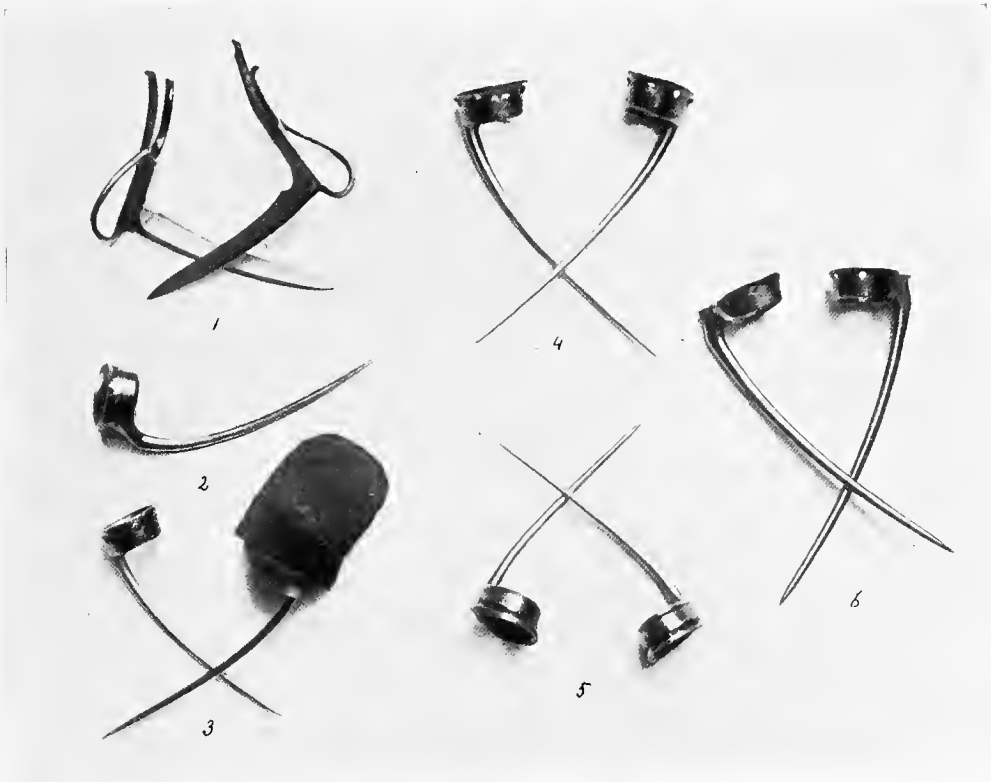
OLD ENGLISH GAME HEN

dead or dying another falls, another, and yet another. Two are left, which, though bleeding from many a vein, are yet undaunted; they meet, they rise, they fall, and, as they lie, strive yet to rise again to strike. One is up, he staggers, falls dead on a heap, an inanimate mass. There is a movement, the other feebly lifts his head, struggles to rise, and falls!" Is it sport? Is there any sport in this sort of thing, this "battle royal"? Truly the last survivor, if any, wins—wins what? Credit, renown, lasting honors, a happy life to the end of his days, or what? All this slaughter, this . . . the winner wins the stake-money for his owner. "But," says the editor of the *Sporting Dictionary*, writing as long ago as 1803, "this species of sport is but little practised now, and that in the most distant and remote corners of the kingdom." And it may be added happily now—nowhere.

Facts About Spurs

The artificial metal spur as an appliance in cock-fighting is by no means a modern invention, though its use has been in abeyance for a considerable period, especially in England, if not in other countries. As late as the seventeenth century it could scarcely have been the custom, for Gervase Markham, writing on the subject of Game-fowl combats, distinctly states "that having so far prepared your cock by trimming, you shall with a knife scrape his spurs to points, and then put him down to try his fortune." As to when it became the common practice to cut off the natural and to arm the birds with artificial spurs is an undecided question, yet there is but little doubt that at the Cockpit Royal weapons both of silver and steel were at once the usual and necessary arming in the struggle for life or death. The use of these, instead of the natural spurs, has to the thinking mind somewhat too hastily and recklessly been called barbarous, when in point of fact it really is not so, tending, as it does, greatly to shorten the conflict, the striking power by such means acting with more deadly certainty, every blow telling in a far more conclusive way than the softer, natural, less efficient young spurs of the scarcely year-old "stag," they being weak and less hurtful. This possibly would not be so with the older, fully matured cock. Yet even here the artificial spurs would end the fight sometimes at the first stroke, and if not, then after a few passes had been exchanged. Therefore, reasonably speaking, the use of the metal weapons is less punishing than without, and the term barbarous certainly has been, and is, misapplied.

The artificial spurs were sometimes in the remote past made of brass, iron, steel, or silver. Those that have been discovered are not only of the two latter metals, but also differ much from the modern make, insomuch as they more resemble elongated protective cappings than absolutely lengthened natural forms for defense or destruction, while not a



1. Manila spurs, native workmanship, recently sent home by J. Hancock, C. E.
2. A very old drop-socket steel or iron spur.
3. A pair of steel spurs of Kendrick, Kennick, or Kenick make.
4. A pair of Watling steel or iron spurs.
5. A pair of Singleton steel spurs.
6. A pair of long drop silver spurs.

few of the spurs made in the eighteenth or nineteenth centuries have varied from two to six inches in length from the heel to point; though the size of the latter is with me but a matter of hearsay, yet, being on good authority, it is given as fact. Not all were made of metal, some of the continental being bone or horn.

The making of cockspurs was a great art, and by no means one of easy production; while as often many hundreds or thousands of pounds

depended on the battle, it is not surprising that the manufacture received every care and attention, both in the material, shape, bend, curve, and fitting, the metal being of the highest temper, welded into form with thoughtful touch and practical nicety. Birds of a certain length of limb required one make, others another; while the mode of attack, varied action of hitting, striking, or blow-delivery had, or should have, appropriate lengths, inclines, or well-considered curves. The practiced setter knew this, and the spursmith could and did make to the requirements with an exactitude scarcely to be excelled. With such perfection of material and knowledge of the craft but few names were associated, and of these their handiwork was treasured, valued, and carefully kept. As heirlooms, many exist at the present time, with oft-told stories of battles won by the gallant warrior birds which wore them, aye, and that long ago. Yet even these, of high courage and with desperate fighting power and endurance, when armed with steel would, as cravens, turn from "silver," though of the same size and make. This is so well known that when a match was made the terms used were for steel or silver.

The illustrations show the different makes of some of the most celebrated cockspur armorers, and, more conclusively than words, their varied forms for usage.

1.

OLD ROMAN SILVER SPUR
Found in Cornwall
The property of Mr. John Harris

TRANSATLANTIC GAME-COCK

Photographed and owned by Dr. H. P. Clarke, Indiana

AN AMERICAN COLLECTION OF COCK-SPURS

Dr. H. P. Clarke, Indiana

IN THE illustrations reproduced herewith are shown what is undoubtedly the most varied assortment of artificial spurs in the world. Numbers 1, 3 to 6, 8, 14, 15, 35, 36, 43 to 46 were made at Indianapolis, Indiana. The other specimens are freaks and foreign spurs collected from many different parts of the world. Of the forty-eight specimens here shown, each one represents a pair excepting the slashers, which come singly and are used only one at a time.

Numbers 3, 6, 8 and 36 are the famous "Gold Spurs" which have attracted considerable attention in some of the largest cockpits of this country and Europe. They are triple plated with gold. These are the "Armes Americaines" which in 1894 revolutionized spur-making in France and Belgium. Number 3 were used at the International Concourse of that year, and with No. 6 was won what was in some respects the most important main ever fought in Europe: America against France and Belgium combined.

Numbers 1, 3, 4, 5, 6, 36, 43 and 44 are Full Drop Sockets of various lengths from one and a half to three and a half inches, the longest (Number 36) being a pair of shake-bag size made expressly for slugger cocks and locally known as "Soul-Searchers."

Numbers 8 and 46 are Regulations. Number 45 is of Cincinnati style. Numbers 14 and 15 are Half-Drops, Front Drops or "Jaggers," as they are called in different sections of the country.

10. Drop Sockets made in England.

11 and 12. Ordinary French gaffs.

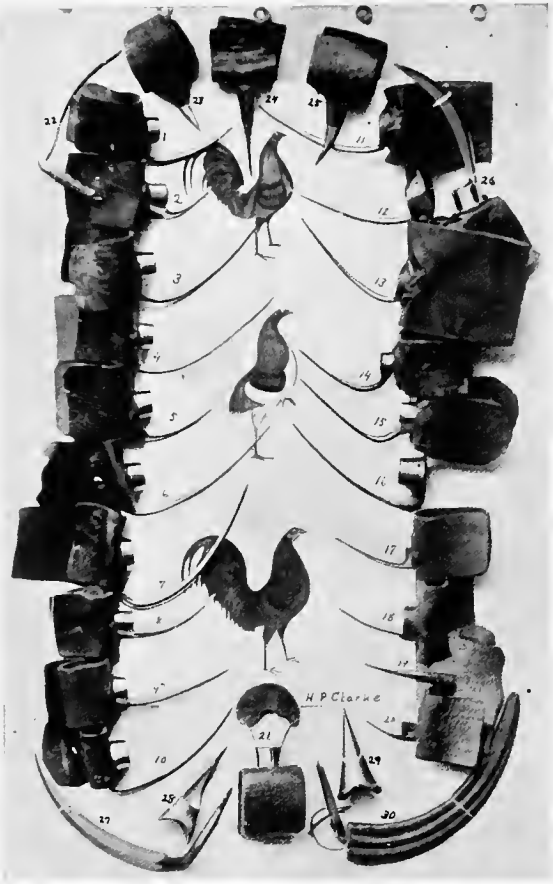
13. From southern Belgium.

17. Typical English steels, made by J. Tepin.

19. Very old gaffs from Scotland.

21. Meat-ax Slasher of American make.

22. Texas Slasher from San Antonio.



AN AMERICAN COLLECTION OF SPURS
Reproduced by courtesy of the owner, Dr. H. P. Clarke

23. Ivory "haip" from Scotland.

24. Very old tin spur, early history unknown.

25. Scottish "haip"; natural cock-spur with metal socket.

26. Round-socket Slasher, American make.

28. Horn spur from a Belgian settlement in this State.

29. Horn spur from northern Belgium.

31. Bronze socket, iron blade. Very ancient relic from *pays d'Artois*, or "country of Artois," France.

27, 30, 32, 33, 39, 40. Slashers from various parts of Mexico.

34. Australian gaff; Brisbane, Queensland.

35. American 50-millimetre gaff, made to conform to the newly adopted International Standard of Europe.

37. From Manila, Philippine Islands, U. S. A.

38. Filipino Slasher in sheath.

41. One of the famous old silver spurs of England. Made of silver with copper alloy and yet has a temper equal to the finest steel. Spur-making of this kind is a lost art, as no man alive knows how to temper pure silver.

42. "American style" spur from France.

47. Three-inch Slasher from Central America.

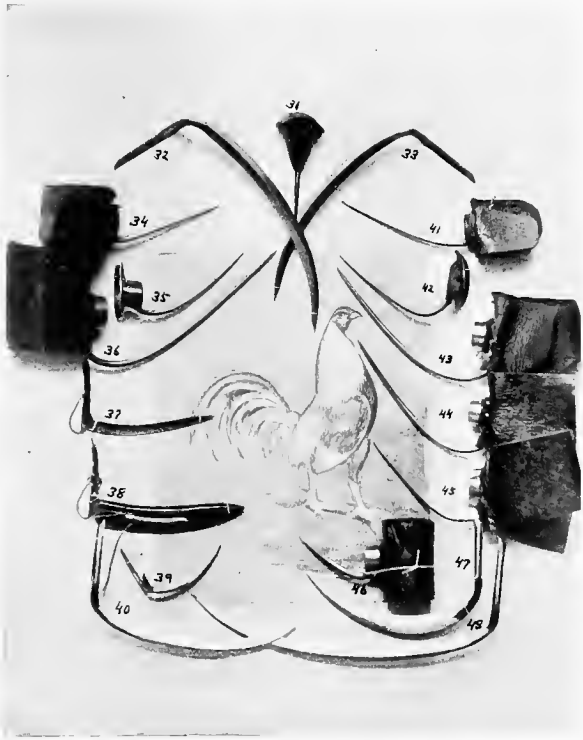
48. Five-and-a-half-inch Slasher from southern Mexico.

American Contests

There are three different kinds of cocking contests in this country: short heels, inch-and-a-half heels, and long heels. In the northern States east of the Alleghanies and also west of the Rocky Mountains the inch-and-a-quarter Regulation, No. 46 in collection, is the only spur which local pit rules allow. In the remaining portion of the North the popular spur is one inch and a half in length, without restriction as to style. This means the use of steels such as Numbers 1, 5, 8 or 14, though the Drop Sockets are objected to in some localities.

In most parts of the South "long heels" prevail, the only requirement being that blades be round from socket to point. Each man may use any style and length he choose, and the spurs most in vogue are Full Drops like Numbers 4, 6, 43, 44. Occasionally one will see Half-Drops, Number 15, and more rarely still such spurs as Number 35. Numbers 9, 41, and the gaffs shown in Mr. Weir's pictures would never be used in the United States. Those old English spurs of silver and steel are interesting as curiosities, but of no value for practical purposes in this progressive age, being almost as far behind the American Drop Socket as the ancient flint-lock is behind the modern Krag.

The Frenchmen of the Province of Quebec use long gaffs, all the rest of Canada short ones. In Mexico and Central America there is no fighting now except in slashers or *navajas*, the latter word being Spanish for razors. In former



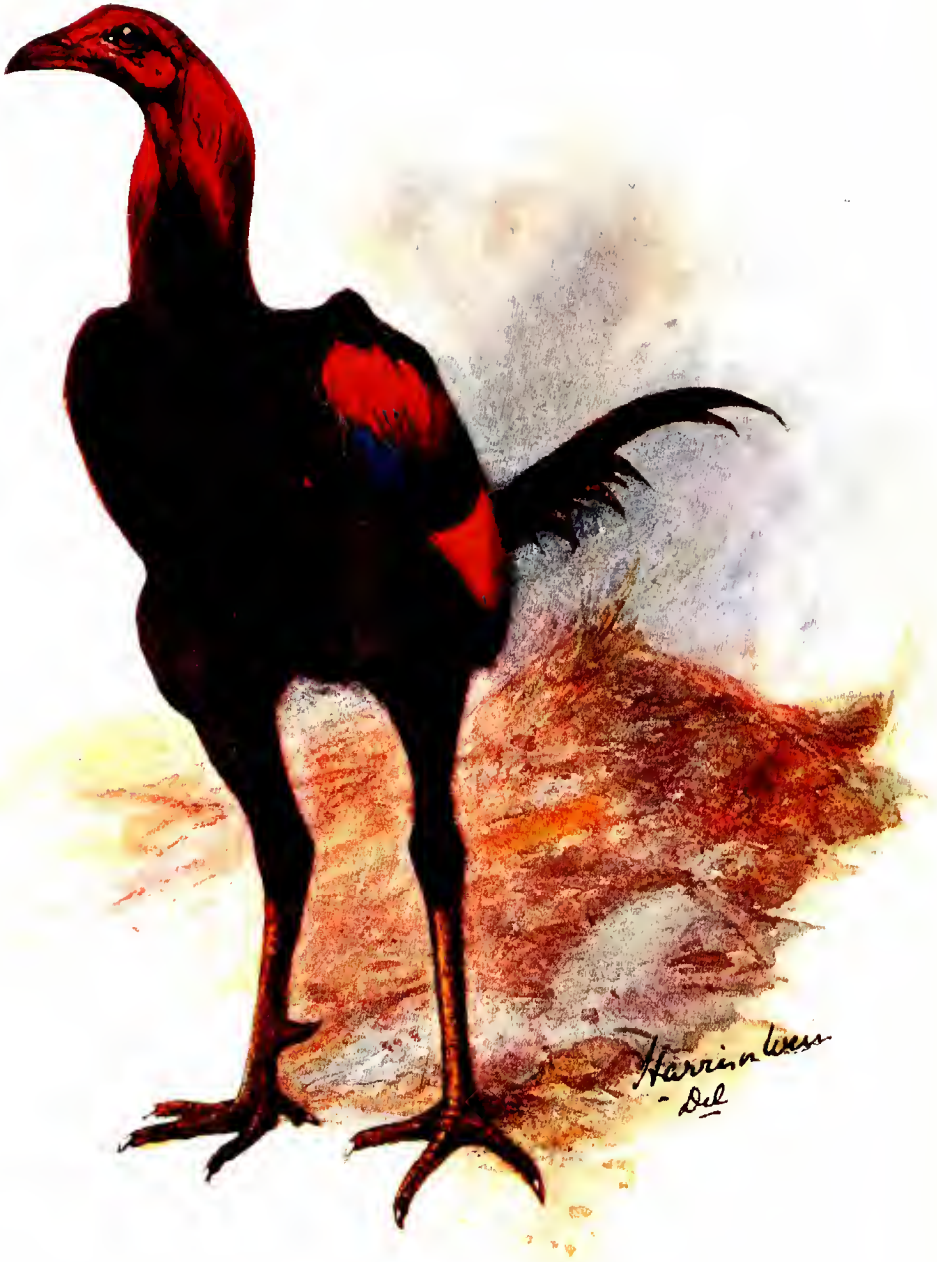
AMERICAN COLLECTION OF SPURS
Owned by Dr. H. P. Clarke

times birds were often fought "naked heel" in the valley of the Rio Grande, until a couple of Chinamen came along with a string of Oriental cocks, some six or eight years ago, and killed that kind of sport, likewise numerous pit fowl. The Cubans and Puerto Ricans fight almost exclusively in natural spurs or their artificial equivalents, *zapatones*, somewhat similar to the Scottish "haips." In Spanish-speaking South American countries the rule is either naked heels or slashers, never round blades, while the Brazilians match their birds in blunt natural spurs, just as do the Japanese.

Across the Atlantic

In Scotland, where the steel (Number 19) was once in vogue, the natural spur or its substitute, the "haip," now reigns supreme. Ireland is about equally divided between naked heel and old-time Singleton. Northern and eastern Belgium employ a spur of horn, Number 29. Southern Belgium and northern France formerly fought in steels like Numbers 11 to 13, then tried to copy the "American style," which resulted in Number 42, then barred Drop Sockets and adopted a spur similar to Number 35, and finally at the Regional Congress of Cockers of the North, June 29, 1901, called for a steel whose blade shall be absolutely straight and horizontal, with a length of fifty millimetres, or about one inch and seven-eighths. This last has not proven entirely satisfactory, and although vigorously upheld by the organ of the fancy, *Le Journal des Coqueleurs*, it is noticeable that many mains the past season were fought *armes libres*, or, as we would say, "long heels."

From a photograph



CAPTAIN HEATON'S CHAMPION MODERN ENGLISH GAME STAG-COCK.

Photograph by Dr. H. P. Clarke.

GAME-COCKS TETHERED ON THE LAWN
An old Mexican method adopted in Indiana

THE MODERN GAME-FOWL

NOTHING stands still; all things change and are ever changing. The admired of yesterday is thought less of to-day, and, where "fancy" leads, will be of the past to-morrow. What is now "a property" is in time called "a defect,"—not that it is so, but so "young fashion" wills it. The flaunting dame toys with to-day and yet sighs for the changeful morrow — with her, only novelty charms. And thus fancy has out-fancied the old English warrior Game-fowl — the sturdy, strong, and valiant bird of ages. It has been singularly interesting to watch the process and the ever-moving change. One at this time can scarcely realize how or why it was done. It is not as if no standard existed of what the Game-cock should be; this standard had been recognized, and bred to, from time without date. The good type of the Game-cock was held in high esteem. Power and symmetry were not only sought but found, for in the pride of beauty, strength, courage and undaunted valor he was peerless and unequaled, much less surpassed— the admiration of all beholders. The change was effected slowly. It was the work of certain judges of birds. One liked less hackle, another not so much tail, a third agreed with both, while the fourth wanted a longer "reach," even though the fighting days were past. The reachey bird was developed. There was a joining of hands, a little Malay crossing, more selection away from the true old type. On and away year by year, passing on and becoming less of the one and more of another, the modern

Game resulted. Still, "the old" warrior is as grand as he was fifty, nay, a hundred years ago. The standard of what he then was is what he must be to-day.

Mr. Weir says: "Whether the change is for the better is really, in a sense, a matter of opinion. Happily, we have the old, as well as the new, consequently there comes to our aid these standards for comparison. We are, however, asked to disregard the old in favor of the new; quite a different style and type, yet still to be called and known as the English Game-cock. There are those who go so far as to say that the improvement is of such high quality that the new breed has not an ounce of superfluous flesh."

In the meager, tall, attenuated form now in vogue with some few highly respected and notable fanciers we have a bird that has been changed from one with a large, full, gracefully feathered and "sickled" tail to one of the scantiest and almost ludicrous dimensions. This is partly achieved by Malay or Indian crosses and careful continuous selection in the direction needed. Turn to the illustrations given of the old-style "Game-" fowls, either on coins, vases, etc., many of the former dating back thousands of years, and not one will be found with a small, thin, narrow tail. Those old breeders knew the many advantages of an extra-sized tail with hard, well-developed feathering. Where are the thick, strong, full and rounded pectoral muscles for the active use of the big, impennous wings—wings of unusual form and strength? These must, of necessity, in the new be reduced, as muscle is flesh. It is very remarkable that at the present time there is a craze for short tails.

Our horses are docked and their tails made ridiculously small to meet the so-called modern ideas of fashion. Irish, Scotch and English terriers and spaniels have more or less mere stumps as tails. There is also the short or bob-tailed sheep-dog; and, far worse than all, the "novelty dog," the Shipperke, a tailless, walking exhibition of modern "fancy." Our Malays, Cornish Indian crosses and Langshans are disproportionately limb lengthened, like our warrior Game. Let us return to the modern ideas of what a Game-fowl should be, with its weakened, stilty, thin, storklike legs, and thighs with shanks to match; the more slender these are the more a lessening section of fanciers prize and value them. When killed and trussed as table fowls these thighs and legs make a fleshless, ugly show. Yet breeders of the new, almost nude—so short and close are their scalelike feathers—tell us this is the same breed that our forefathers loved and cherished.

The fancier of the new Game pretends to ignore the pit, while he carries some of the old warrior bird's points of excellence to an almost ludicrous excess. To a great extent he neglects those of positive utility that were,

CAPTAIN HORNBY'S OLD ENGLISH GAME COCKEREL, 1858
Winner of $500 sweepstake

and rightly are yet, to be found in the true old breed—a breed that has descended to us intact as an heirloom from the time of the Romans in England until our poultry shows of about 1851-55-58, at which date the modern heresy feebly began its growth.

More than forty years ago we had the true old long-pedigree breeds in

plenty, yet even then Mr. Weir noted that when some of the more modern "cockers" caught up a bird, after making a half circle to steady it, they would rest it on one hand and draw the hackle quickly through the other to take out "the spread," as they called it. At the earlier shows of Birmingham and elsewhere it was no uncommon thing for accusations to be made of "hackle-drawing" to fine up the neck or plume hackle so that it should appear "thin and fine." A reaction in favor of the old English birds has arisen. Common sense has asserted itself, as in the end it always will. Thus it is that the length of head, neck, and limb, combined with the paucity and shortness of feather, has become such as to border on absurdity, while beauty of form and natural proportions were on the verge of extinction in England's most favorite fowl. Happily, the admirers and breeders of the true "old English Game" resisted this innovation; clubs were formed, and a stand made against a change.

Photograph by courtesy of Dr. H. P. Clarke.

AMERICAN HENNY GAME

Yet, for all this, it must be admitted that in the hands of some there is a grace and beauty peculiar to the bird as it now is. The absolute failures are numerous, but the few that are good are justified by the result. These, in the hands of such

men as Captain Heaton, bred as he breeds them, shown as he shows them, are widely different from the general rut of weak-legged nonentities. With him may be classed the names of Ainscough, Briarly, and others. In such hands there is something beyond the bird to admire not only in production, but the wonderful way in which they are conditioned, and the faultless style, vigor, and fulness of life in which they are shown.

Points of Beauty

Head, long and narrow; beak, straight, with a light curve and finely yet strongly set on the head; the eye large, full and fiery; the neck long and thin, yet strong shoulders; wide in the body, deep, but rounded, and flesh on breast full and hard, with a slight tendency to length; thighs, long and thin, or slender, slightly bent inward; the legs long, feet long and well to the ground, with sharp toe-nails, spur set on rather low; tail narrow, small, and carried low, the whole of the feathers short, hard, almost like scales, yet moist or cool to the touch; general carriage somewhat of a tendency to be upright, yet not so much so as the Indian Game, or Malay. In appearance, when good, it is light and elegant (but this is the exception and not the rule). The hen is built, to use a modern expression, on the same lines.

It is recorded that Captain Heaton, one of the very best fanciers of the day, has by no means reluctantly paid 300 guineas for three cockerels, while, on the other hand, many of his own breeding have realized as much. He, of all the modern Game fanciers, is the winner of champion cups. Yet the interest wanes. There are so few prizes and so many blanks, unless the birds are bred, handled, and conditioned, not only by the practical, but, it may be well said, the highly gifted fancier. Such men are not of an every-day occurrence, as a reference to the "show-pen" clearly proves. Whether the new creation will be in existence fifty years hence is a moot problem which only time can prove, but a reference to the entries of the Crystal Palace Shows leads to the supposition that the bird is gradually subsiding.

Locating the Range

The range, if possible, should be beyond the hearing of the hourly challenge of neighboring cocks. "A thing," says Mr. Howlet, "which is apt to stir up their choler. It is, as Captain Markham (1620) so much

commends, a lodge, grange-house, or mill, because, for the most part, such places are remote from neighbors. Choose a walk that is graced with solitude, having green fields or pleasant meadows on one hand and mountainous, hilly, dry ground on the other. A murmuring brook, rivulet, or, in their stead, some pleasant pools of clear sweet water is desirable. Avoid having too many hens in your walk. Indeed, had the cock but two or three hens it is enough, and the walk would be better than when a larger number is kept. Many hens make a cock too lustful, and greatly debilitates a bird of the Game, though length of turn and good feeding will much restore a cock that is decayed."

Many of the old breeders varied the number of the hens according to the time at which they will put up. This system is the best to adopt. In January, two or three hens, according to the age of the cock; in February, four hens, or at the end of the month five. With Game hens never add a new one, but continue with the original number. A fresh hen would most likely have a sorry time, if not killed, before the hens in possession became friendly. It is well to get hens used to each other before the introduction of the cock. In a measure it prevents favoritism, but the cock is sure to have a preference in this respect.

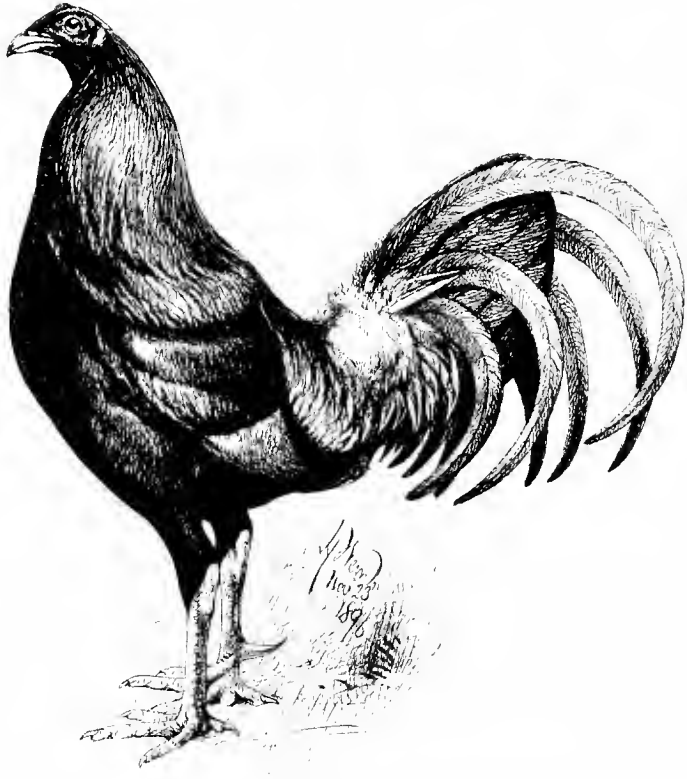
If there is a wood or shade to which the birds can retire during the heat of the day in summer it will be of great service in keeping them in health. Game-fowls, in particular, like to perch in the trees either in damp or hot weather. If circumstances will permit of their being roosted out, it is far preferable to a hen-house. It contributes to their often becoming exceedingly wild, and, if frightened, they often fly beyond their allotted bounds and are lost.

When Game-fowls can have full liberty and a wood to fly in and about they have much stronger wings, legs, and better feet. Alert moving about in high grass, underwood, among the boughs and leaves of bushes and trees, gives a gloss and color to their plumage that can be obtained in no other way. Neither do their feathers or shanks ever present that sunburnt hue that must be with those kept more in the open and devoid of such cool and invigorating shelter.

Game-fowl will do well in an uninterrupted run of a stack-yard. The ordinary farm buildings and straw-yards, where proper nest places are provided and where they can roost, will suit them even in winter. Fowls having such full liberty are seldom, if ever, in any way diseased. With

this freedom one essential is clear—clean water in a shaded place twice daily, and a pile of sand and wood ashes under cover close by for a dust bath. Care should be taken to feed them, when possible, on different ground day by day, thus preventing any particular spot being stenched.

If two clutches of chickens are required of the same hen in one season, it is best effected by putting her first eggs under another fowl of the same breed. The Game hen should be kept under a coop among the other hens until the propensity to sit has passed away. If she is taken away while the "heat" lasts she will be fresh again to the run, and there will certainly be considerable fighting and perhaps much disfigurement on her return. On the next occasion of the Game hen wanting to sit, it is advisable to let her do so, otherwise she will get a weakened constitution. It is argued that by continually preventing hens from sitting, after a generation or two the inclination becomes less frequent. This may be so, and is possibly correct. Mr. Weir has prevented hens of the Game from sitting the whole year. They continued laying well. The second season they were found less inclined to sit and more regular in laying.



BLACK-BREASTED DERBY OLD ENGLISH GAME
Bred and owned by Harrison Weir

Sometimes the cock will take a dislike to a brood hen. This is particularly so among Game-fowls. The hen must be removed in such a case; otherwise serious consequences, possibly death, are likely to occur to the hen. Some breeders remove the cock for a few days, putting him with the hens a short time each day, during which time the hen, if broody, is taken up.

The number of eggs for a clutch should vary according to the season; nine is sufficient in February, thirteen at the end of March. The Game hen, being small, is unable to cover with proper warmth as many as twelve or thirteen in cold weather. She cannot well mother the chickens if hatched. For want of warmth they are likely to be weakly. Should the chickens hatch unequally, those first out should be gently removed, so as to disturb the hen as little as possible, and placed in a well-warmed flannel-lined basket near a fire. When all are hatched they should be returned at night; otherwise, it is possible the hen may kill them. The next day the hen and brood should be taken to a dry place, put under a coop, and left at liberty in a room or under a shed. Nothing is more likely to kill little chickens than wet, dirty, or long-grass runs. Many fine, healthy broods are destroyed by being confined on damp floors, wet straw, or long grass. As a rule, young chickens cannot be kept too dry, though they may be too hot.

Photograph by courtesy of Dr. H. P. Clarke.

AMERICAN GAME STAG

Game chickens, like Hamburgs, require special attention for a week or two—in fact, until their heads are feathered, after which they have passed the most critical time. At first they are best fed on stale bread-crumbs and hard-boiled eggs chopped small and well mixed. Crushed

and broken wheat later on, with a very little raw meat cut fine and mixed in with chopped lettuce or tender young grass, with cheese crumbs rubbed small in ground oats can be used; occasionally a meal worm may be given. Mr. Weir does not advise whole oats or wheat until they are at least six to seven weeks old. Ground oats or maize meal may be given, slightly mixed with boiled potatoes and some thinly sliced fresh cabbage; naturally fowl do not get grain in the spring. Above all, clean water is essential, but many old breeders prefer barley-water for the first week or two. Some advantage is gained by the chickens being brought up under ordinary barndoor fowls, because they are generally excellent mothers, and rarely quarrel with other hens.

With Game chickens, the young cocks, if well bred, prove to be most pugnacious at a very early age. To a certain degree this can be somewhat remedied by removing all the young pullets. Thus on one occasion a clutch of twelve little cock chickens were running together with the hen. Being of varying sizes, they seldom fought. Neither did the other sex, removed at the same time. This is more easily managed when the eggs are hatched in an incubator. Old "cockers" used to select the most promising chickens from the broods and destroy the rest, thinking that a less number would thrive better. Mr. Weir does not agree with this practice, provided the number does not exceed ten or twelve. They help to keep each other warm.

There are three ways of cutting the comb, says Mr. Weir: The first is close to the head, which is called the low cut; the next is that slanting upward toward the back of the comb, called the slant cut; and the third, the more ancient, cutting on a curve, leaving the comb higher in the middle and so round to the hook of the beak, called the high cut. The latter is practised in America, though at present in England the second is thought to be the best. In all cases the cockerels should be shut up for a day or two on low diet before the operation, after which, if young, they may be dubbed without loss of blood. After a week or two their wattles may be removed. The bird is thus saved from much possible after-mutilation, torn combs and wattles by fighting. But is it necessary? I have been credibly informed by an old cocker that many of the birds of the cockpit in the old times had entire combs. They generally appeared to have more stamina, and were more daring and absolutely ferocious. The red combs of their adversaries, acting as an incentive, tended to enrage them in the

same way that a red flag does a bull. The comb and the wattles of the cock are not only ornamental, but by their elastic resistance are natural buffers to break the force of a blow. As such, though vascular, they are almost devoid of feeling. Of this I am convinced after many years of close observation. I am also of opinion that if the combs of the cockerels are cut off when young—that is, as soon as they are of sufficient size and in the way stated above, the operation is not painful. Instead of being, as some aver, cruel, it is, on the contrary, a merciful act under the conditions.

MR. FLETCHER MOSSES' OLD ENGLISH GAME, 1892

The havoc and disfigurement that ensues when young cockerels are kept together undubbed is not only lamentable but often very destructive; therefore, on the side of humanity, in cocks of the Game it is a matter of necessity. If every bird could be kept separate this would be another matter, but where twenty, forty, sixty, a hundred or more are raised, such isolation becomes impossible.

When a cock is put up to be conditioned for show, it is often necessary to cleanse the system. The following pill or condiment is said to be of service and is recommended by Robert Howlet in the "Royal Pastime of Cocking," 1709: "Take of white sugar-

candy, rosemary, feverfew, and ground ivy bruised; mingle these with sweet butter; let the sugar-candy be finely powdered, and let these be well incorporated together. These will cleanse a cock of grease and add to his strength."

Recipes for Making Cock-Bread

Mr. Weir gives the recipes of several kinds of cock-bread, most of which were generally considered to conduce largely toward getting a farm cock into the highest possible condition. If this be so, it is possible that something of the kind may be found preëminently useful in preparing birds for the show-pen, though, in Mr. Weir's opinion, good outdoor feeding, with an unlimited walk, cannot be surpassed. Some fancy that the common baker's bread is as good as any. Instead of plain bread, Mr. Weir found toast and a little ale once a day or at night, just before exhibiting, highly invigorating.

The following is another recipe for making cock-bread, given by Howlet: "Take of wheat, pease, beans, and oats of each a like quantity in meal or flour finely dressed, with the juice of liquorice and a little sack-wine, or strong stale beer with brown sugar-candy, aniseeds and carroway-seeds mixed together; but if the season be hot, you must put white wine instead of sack, and as much common ale as will make the flour up into dough, with the whites of ten or twenty eggs, and a yolk or two amongst them; and this they take to be the best sort of bread to feed cocks withal. There are those that think the finest wheat-bread with good store of hot spices in it, and soaked or sprinkled only with simple water or juice of wood-sorrel, to be the best food for a cock. And some again heed not what bread they have, so that they have good store of flesh to give their cocks, crying that up for the best and strongest food. But in my opinion, these extremely err in fancying flesh food to be fit for a cock; these carnivorous feeders understand not the nature of these valiant sort of birds who force such unnatural food on them."

A little meat may be given to advantage with other food, but vegetables should, in some way, be mixed with it. Mr. Weir prefers in summer ground oats, with a very little ground barley, wet with milk or water, some finely chopped bullock's liver, and cabbages.

"Some feed their cocks," says Mr. Howlet, "twice a day, and others three times, and water them between each feeding, and that for the most

part with common fountain water; but the following barley water is best, especially in summer, and indeed all the year long, when the climate is anything hot and sultry; for this water excellently cools and wonderfully refreshes the vital spirits that labor under heat; it has also a cleansing quality, and is highly restorative when feverish distempers afflict the body, therefore preferred before common fountain water: Take barley and boil it in spring water. Let it stand to cool and settle; then pour off the settlings and give this to your feeding cocks.

Photograph by Dr. H. P. Clarke.

TRANSATLANTIC STAG

Winner of two battles at national tournament in 1898

"But, in my opinion, there is yet a better sort than any of these, and I make it thus, viz.: Of the best and finest wheat-meal I take three-quarters of a peck and one-quarter of oatmeal of the purest sort, and first of all mix these well together; then add the whites of twenty new-laid eggs, four yolks, an ounce of the best extract of liquorice, and as much of the fine powder of brown sugar-candy, a quarter of an ounce of aniseed and carroway-seed, grossly bruised, with a lump of good sweet butter as big as your fist at least, and a quarter of a pint or more of the best white wine that can be got for money, with three or four spoonsful of syrup of clove-gilliflowers put into it, and a date or two, with some candied eringo roots cut very small, so that it may be scattered into every part; and let these ingredients be well worked together in some tub or pan for that purpose with your hands until you are satisfied that they are properly and thoroughly incorporated. Then take wood-sorrel, ground ivy, feverfew, dandelion, and burrage, of each a little quantity, and distil them in a cold still; add three or four spoonsful of the pure juice of lemons to every pint of distilled water, and add as much of thin julep as will serve to make all into a good stiff paste; let this be wrought quick and made into little flat loaves, which ought to be a day or two old before you open them, and

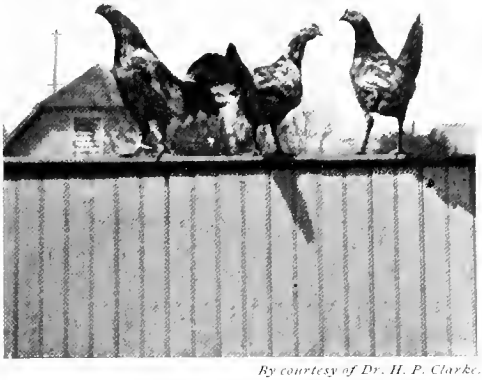
THE REV. H. H HUTTON'S BLACK-BREASTED BRIGHT RED OLD ENGLISH GAME

Bred by Mr. Herbert Atkinson

then, being well rasped or pared so that none of the brown or burned outside remain, they may then be cut and given to the cocks as aforesaid. And this I take to be the best and fittest sort of bread for English cocks, it being a food that does greatly strengthen and exhilarate them, and at the same time cools and keeps them temperate in their bodies, provided you have regard to the season, for in hot weather, or when the climate is more than ordinary hot, there must be more of the cooling ingredients added, and fewer, or a less quantity, of those that are hot in nature."

The Muffled Game-fowl

In the Muffled Game-fowl we have a very distinct form of the old fighting-cock, though perhaps it is not so apparent to the uninitiated. It differs much in form, carriage, weight, and in the bearding and muffling; it is generally a much heavier-framed bird, stouter and broader; the head is thicker and shorter, the base of the skull wider and rounder, the beak larger and much curved, especially in the upper mandible, the point or end being down-turned and hawklike; the eye is usually dark, full, and fiery; the feather muffling often extends behind the skull, thus thickening the head and neck hackle, while at the sides it covers the cheeks and becomes an almost profuse beard about the lower part of the beak, almost hiding the wattles; the comb is stout, and in some cases semidouble, and there is mostly a fierce, courageous expression, and an undaunted bearing, almost amounting to ferocity. The general make is sturdy and strong, the girth being large; the breast is round and broad, while the full-sized wings are up-carried and almost touch at the quill ends under the tail, so devoid of offal is the hinder part; while the grand flag-tail has an upright, almost forward carriage—a sure indication of high-mettled stamina, vigor, and bravery; it has a



By courtesy of Dr. H. P. Clarke.

TRIO OF TRANSATLANTIC PRIZE-WINNERS
Owned by Dr. H. P. Clarke, Indiana

lofty, upstanding carriage, and is well balanced on stout muscular thighs, legs, and strong shanks, with well-formed feet. Usually it is somewhat heavier than the old match cock, weighing as much as seven or even more pounds, still it is active, alert, and has a style of going and, it may be added, doing all its own.

The hen is a female counterpart of the cock, and has a peculiar and attractive appearance, the head often having, besides the muffling, a neat rounded topknot, though this is not considered a point of excellence. They are good layers of fair-sized eggs, careful and protective mothers. If anything, they are the most hardy of all the varieties of the different races of Game-fowls, and certainly deserve, if only as table fowls, much more attention and favorable estimation than is at present accorded them. As to color, the best, or at least those that have come under Mr. Weir's observation, are the black-breasted dark reds, crow-winged, black in beak, shanks, and feet.

The Tasseled Game-cock

The crested Game-fowl is not a modern creation, but of ancient, though unknown, origin. It is one of the birds mentioned in "The Treatise on Poultry," 1810, thus: "The English tufted fowl does not surpass ours (French) in size, but it stands higher on the legs. The cock, which has rather an aigrette than a tuft, and the bill and neck of which are of a more open shape than in the common breed, is superior to ours for fighting." Other writers, both ancient and modern, have referred to it as being a distinct breed. In form and feathering it closely, if not entirely, resembles the ordinary Game-cock, excepting that it is generally of somewhat stouter make, and has a more hawklike beak. The lark-crest at the back of the comb is small, and about one inch and a half in length; the feathers are hard, crisp, narrow, with loose web and rounded at the ends; the colors are mostly very rich, and black-breasted reds with yellow or orange shanks and feet are considered the best, and are the truer breed.

In their style and habit they are bold, active, and vigorous, and have the reputation of being of the warrior blood that fought for life and limb in the old pit days. One of the best strains, and famous for strength and courage, was that of Richard Stamp, which at his death passed into the possession of John Harris, in whose company Mr. Weir saw some twenty to thirty in unlimited range in 1894. There, among the then flowering gorse, and

From a drawing by Harrison Weir.

OLD ENGLISH GAME COCK, 1856

amid the far-extending rocks and greenery, they looked the perfection of the Game-fowl, and were by their reputed prowess worthy of the name. It is possible that, such services as theirs being no longer required, ere long the breed will become extinct. The hens inherit much of the fire and

dash of the master-birds. They are strong, well made, and fantailed, like the cocks, and as Game-fowls should carry them high and not low, which gives a soured, craven look, although it is now thought to be a point of excellence by those who profess to be judges of the Game, and yet are ignorant of the very nature, habits, and lofty bearing of the birds of a thousand years. The true breed of the tasseled Game had, and should have, large tails, and these should be carried high.

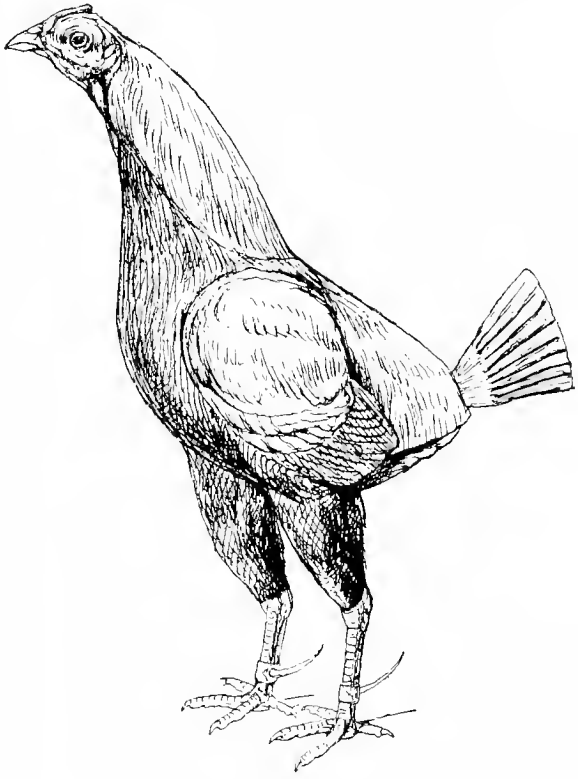
Spanish Game-fowl

The Spanish Game-cocks are mostly small, and their fighting weight seldom exceeds four pounds and a half, many of the most fiery and of dashing courage being less than four; these are exceedingly active and very game. They are generally black reds—that is, black-breasted black reds, with crow wings, and some are black; though small in bone, they have the true English Game stamp, and are believed generally to have descended from birds taken out by or sent to our officers during the Peninsular war. Many have been exported from this country during the last sixty years. As the small size was preferred, some of our best match cocks, weighing but three pounds four or five ounces, found ready sale in Andalusia, at prices highly favorable to the seller. Alike at Cadiz, Malaga, and Algeciras, Mr. Weir saw several that were unmistakably of the English type. They were seldom cut out for fighting, but their faces were decorated with emerald-green ornaments, or markings, a color much admired in Spain; they are yellow- or carp-shanked, very few being white. They are fought mostly about carnival time, and also at other times should opportunity offer, excepting during Lent.

The Henny or Hen-feathered Game-cock

There are few kinds of fowls about which there has been more controversy, or so many unsupported statements, than those respecting the Hen-cock or Henny Game, one believing that they are a degenerate section of the old English Game, another that they arose from an occasional sport, being cultured and then bred for, while others declare they come of some worn-out stocks that have been too far bred in-and-in. Many hold that they are not only a pure and distinct breed, but a strong, healthy, exceedingly heroic, hardy race or section of the old fighting cocks of England.

They are mostly of a larger size than the match cock, weighing from seven to eight and occasionally nine pounds; yet even then there is no coarseness; they are thick in girth, though somewhat long in body; in shape and contour handsome; quick and alert in their movements, yet wanting the proud, aristocratic, stately carriage that is so conspicuous in their sickle-tailed brethren. Shy and retiring, they are difficult to approach, running for cover to any hiding bush or shelter near at hand, and yet with this apparent timidity they possess in fighting a courage unsurpassed and almost, if not quite, invincible, which conclusively shows that there is no lack of health, endurance, strength and vigor, being as full of stamina as any other breed. So like are the cocks to hens, both in style and plumage, that an old Derby white-shanked spurred hen often looks the very counterpart of a Henny-cock.



YORKSHIRE HERO, 1823
Trimmed. The winner of 27 battles

The Azeel—the Indian Game*

This, as its name implies, is the true Indian fighting-cock. It is the high-class Game-fowl of India, and has been known as such ever since the Indian life of Lord Clive — the word Azeel indicating true and noble. The breed is one of the oldest, and the pureness of blood and pedigree have been most carefully preserved for centuries on centuries of years. The origin of these warrior birds has been lost in the dim vistas of the past. It has long been kept as, and is, a royal fowl in India, treasured beyond expression as such. It is of the highest value, being almost

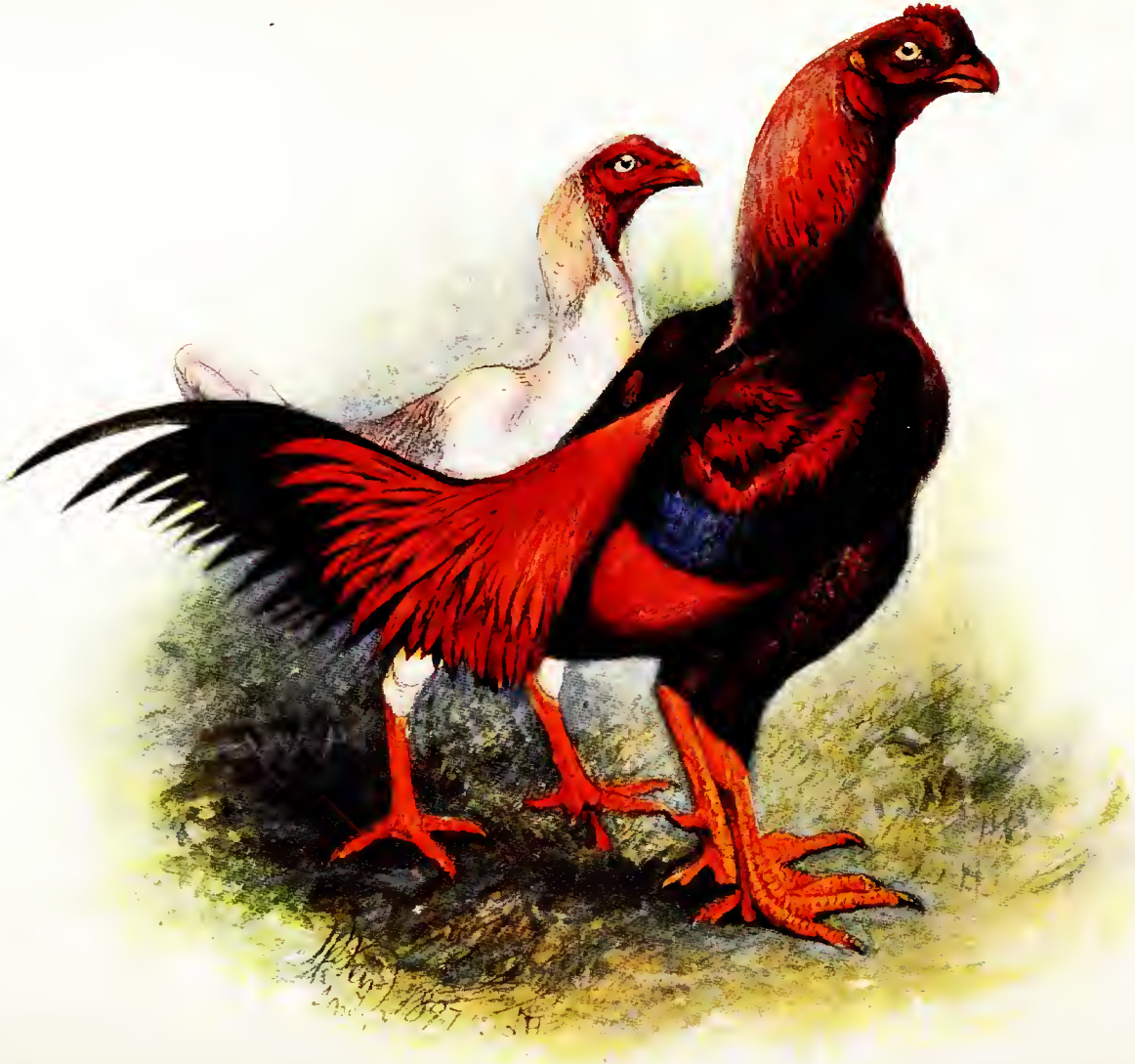
* See page 417, Dr. H. P. Clarke's "General Remarks About Game-fowls"

impossible to procure specimens of the purest blood—the warriors of to-day—the descendants of such renowned in story. "Moorgah" is the Hindoo for cock, while the Mohammedans call it "Mooruh" and "Azeel Mooruh," which is, the exceeding noble cock, or the cock that fights nobly.

From a drawing by Harrison Weir.

OLD ENGLISH GAME, BIRMINGHAM, 1858

As Game-fowl they are game. They are called so because they are emphatically known to be so, with a world-wide reputation as such; a reputation rightly and honorably won, theirs by conquest. Game ages ago and Game to-day, not called so for commercial purposes, but for their steadfast, fiery valor; not for their beauty, which is great; not for their strong, well-knit frames; not for dashing attack, vigor, and strength, nor for their varied loveliness of color and beautiful intricate markings, nor their sturdy make, general contour, fierce eye, squared, wedge-shaped head and powerful beak—no! Not for any or all of these are they Azeel Indian Game, but because they are the true, the high-class, the blue blood of Indian bird warriors, the veriest Game of Game, the Indian



The Poultry Book

By
HARRISON WEIR, F.R.H.S.

American Edition Edited by
WILLIS GRANT JOHNSON
Assisted by
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as Associate Editor
and
Many American Experts

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This book has been revised and rewritten from the American point of view by American experts.

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"The Farm or Homestead Fowl"

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Game, and the only proper and rightful owners of the well-earned appellation; pure in blood and pure in reputation, theirs is a world-wide fame. Those who have seen them in India—birds such as never reach our colder land—have told of their prowess, of their ungovernable, unwearying, unconquerable tenacity in battle; with them, as with our English Game of old, it has ever been—death or victory. Such are the Indian Game, the Azeel, the true, noble, thoroughbred—Game.

Sir John Astley, in his very interesting book, "Fifty Years of My Life," 1894, gives valuable information on many things, and so, respecting the Indian Game-fowl, he says of his brother that "When he came home he brought with him some of the higher type of Indian Game-birds, and I was surprised to learn the value set on those birds by the native sportsmen and the trouble to procure and land them in this country; yet some of them had succumbed on the homeward journey. I noticed one black hen particularly, and upon asking if she was of a high-class tribe, was assured she was the very top of the pedigree class, and that no money could buy her; in fact, he would have lost caste had he put a price on her in particular, when he had been offered £20 each for her eggs." She never laid in England; but Sir John Astley states she returned to India, and laid on board the ship, and he dryly adds, "My readers will be satisfied that it would be very difficult to set a price on such a bird."

These Indian Game have a wider, fuller, rounder head than our English, and are shorter and broader in the back; the product of a cross from the two breeds sometimes turn out well, but are not to be depended upon to be like either—pure. From the foregoing it will be seen how highly the natives of India value pedigree, and it is but a haphazard, unwise proceeding the breeding without it; whilst with it, even with the greatest care in the matching, disappointment only too often occurs; and yet it is saddening to hear some people, ignorant of Nature's laws, restlessly advocating a cross, a breed out and in, after which they can never know, nor others with the very least certainty, what can or will come of it. Such has been the case with the Azeel; in no cross has it proved a success.

A friend of Mr. Weir's had some very high-class Indian Game, long in pedigree, from Madras, in color black and some a soft blue, and yellow in the shanks; and although he was a fairly good ordinary breeder of poultry, by unscientific matching he not only lost the beautiful purity

of feather coloring, but he also found that it was most difficult—in fact, almost impossible, to retain the orange yellow of the shanks and feet; they would come stained. If this were so in the pure breed, what would he have had to contend with had he crossed "out" and "in"?

Captain Robert Buller Young, writing to Mr. Weir of this breed, says that "The ordinary fighting-cock of India is very different from what we know here as the Azeel, which, from what I gather, is of the highest class, and I have heard it termed the rajah's Game-fowl."

Of the ordinary fighters he says: "To begin with, many of the cocks are hen-plumed—that is to say, an absence of sickle feathers, having a square tail and scarcely any bright feathers, either on the shoulder or hackle, with a fair comb, but for which otherwise it might pass for a hen." "Here is another proof," says Mr. Weir, "that our Hennies are distinct breed, and possibly originated in India, as our fine old English Game is said to have done many centuries ago."

In color the Azeel is variable, but always more or less beautiful. Like most of the Indian domestic poultry or pigeons, there is a finished, refined, almost poetic, touch about both the cocks and hens, the spangling tints being generally brightly and charmingly arranged, widely different to any European breed. In habit they are peculiar, being wonderful scratchers, almost burying themselves in the deep holes so made in their runs. Mr. Weir's would most industriously turn over, to a great depth, all the available ground continually; and were scarcely contented, if ever so, unless they were digging or delving, their extra-strong limbs and feet making the process a light matter of exercise, though presumably they were in search of insect life. Again, though fierce in combat to a remarkable degree, both sexes were unusually tame, allowing themselves to be caught up and put down as desirable at his will or pleasure; they would feed from his hand, and perch on his shoulder in the most trustful way imaginable, which rendered them enjoyable pets to keep.

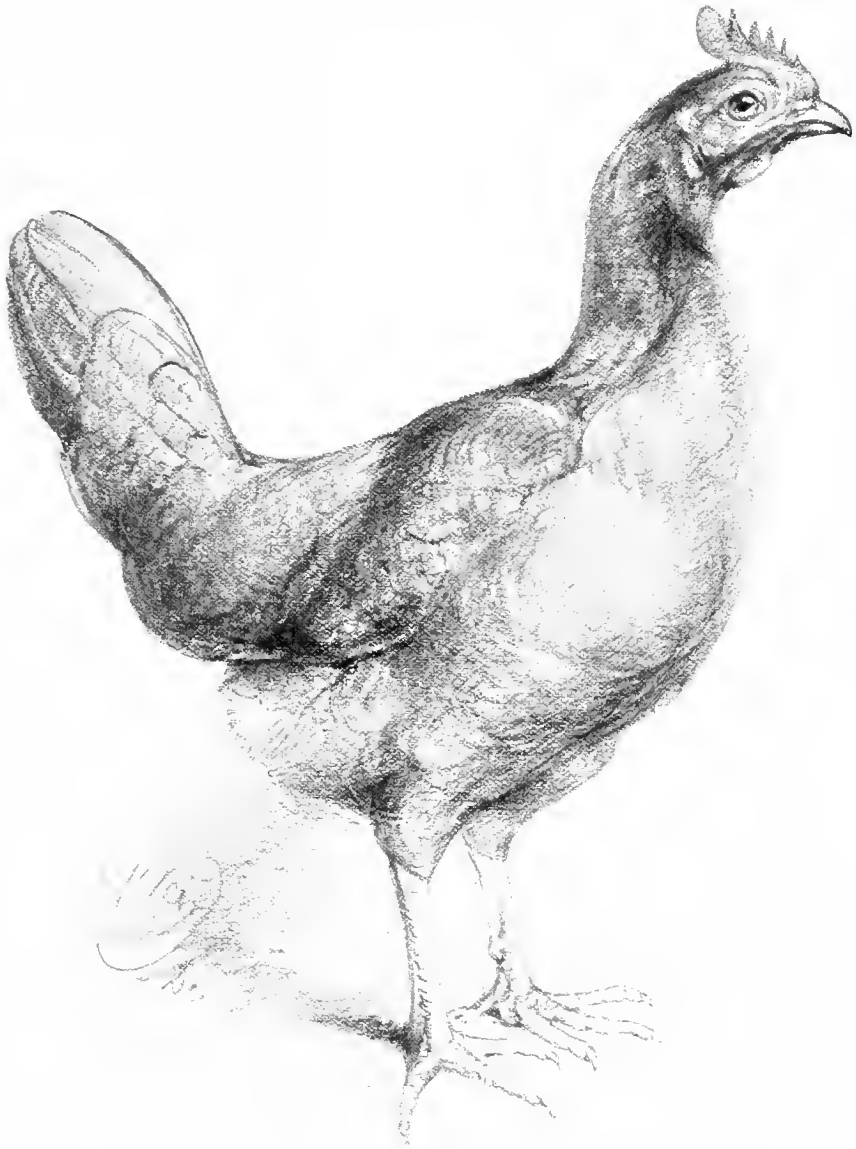
As a table fowl it is of wonderful shape, the breast being a counterpart of the red grouse, or between that and the partridge, plump, broad, full, and rounded; the skin is thin, and the flesh very fine in grain, and close, but rather dry and somewhat hard, for the reason that it will not put fat on the breast nor between the layers of the muscles, though it does somewhat about the thighs and legs; the bird, however, fattens inwardly. One cock that Mr. Weir had was very fleshy, particularly so on the breast,

though apparently lean, but it died from apoplexy, when, on examination, the inside was found to be—to use a common expression—one mass of fat. If the breed could be got to assimilate more fat on the breast, it would be undoubtedly one of the best table fowls that we have. Grouse-breasted to a degree, it, like the grouse, is thin—lean.

BLACK-BREASTED BLACK RED OLD ENGLISH GAME "CROW ALLEY"
Owned by Mr. John Harris

What power there is in the short, thick, bony, straight shanks, covered as they are with stout, large scales! What strength in the feet, with their strong, thick-made toes, horn-tipped with stout, curvicular nails, all-powerful for attack, defense or scraping; the thighs hard and muscular, well apart, and sparsely feathered; the head broad and thick; beak strong, stout, and well set on, slightly curving from a triple pea comb to the point; eyes deepset, yet in themselves bold and prominent, pearl-colored, pink-cornered; face glowing purplish red, slightly beset at the sides with bristles; deaf, or earlobe small and hard; wattles small, both red; point of breast naked and red; shoulders broad, stern narrow, making the body almost triangular; wings very strong, well out at the butts or shoulders, carried level, showing the big first joint bare; neck round, powerful and medium length, if anything rather short than long, rising curved or bending in the elevation; tail carried low, flat, the feathers narrow and hard, with slender sickle feathers, thin and sharp in point, but wiry in substance; tail-covert fine, evenly laid on, close, firm, and compact—that of the hen a little short, but not too much so, carried low, and tapering; all the plumage hard, almost scaly, yet feathery, but devoid of fluff; body heavy for its size, well-boned, close in texture, and strong; the carriage somewhat upright, but runs with a stooping gait; general appearance combative and dauntless, moving quickly and fearlessly. Fortunately, there is no standard for color, nor should there be, so many of our best breeds being

MODERN OLD ENGLISH GAME-COCK
A great winner—cut out for fighting. This cock won at Lille a few years since



OLD ENGLISH GAME HEN—PRIZE PARTRIDGE
Bred and owned by Mr. Weir

more or less sacrificed to a slavish craving for certain colors to the exclusion of others, often quite as beautiful, and in the opinion of some more so. The so-called colored Dorking is a notable example of this, the dark and silver-grays now only obtaining notice, while the black-breasted reds, the

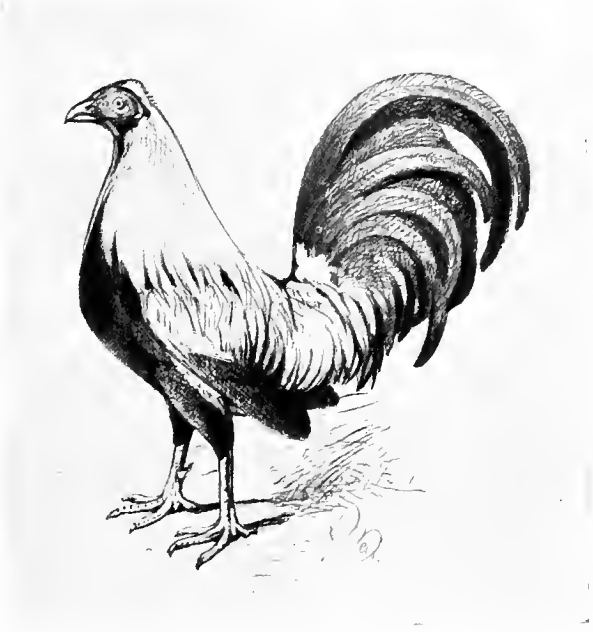
golds, the spangles, and the speckles are entirely neglected ; therefore, well is it for a breed that it not tied to color as a point for or against. In this matter the Azeels are preëminently beautiful, the formation of the feathers lending an additional charm to the various blendings. The white, with an undertint of lilac-gray, yellow shanks and beak, and silvery eye, being one among the most approved. The black has its admirers, and what a black it is! How brilliant! rich bronzy and purplish, with an iridescent emerald-green, flashing to every movement of the bird. Then the self-colored blood-reds, with black hackles, and these, with a delicate black lacing, now claimed as a property of an alien variety of fowl. Spangles and splashes, and almond-tinted tans almost complete, but do not exhaust, the list of the varied featherings and colorings of these rajah-treasured fowls.

Profitable poultry they are not; as charming and delightful pets or hobbies, saving and except the old English Game and some few others, and these very few, they have no peer. True, on account of their courage they are somewhat difficult to keep, the hens even having their likes and dislikes, mostly the latter; as a consequence, these end sometimes in the death of one or the other, or the temporary maiming or disfiguration of both, such being especially the case on the introduction of a stranger. This may be partly remedied by cooping the newcomer within sight of the other fowls for a few days. They are by no means prolific breeders, laying but few eggs as a rule, but there is much difference in this respect; they are good and close sitters, excellent mothers, defending their little ones with the utmost audacity and fearlessness. The chickens require some attention for the first week or two, after which they shift for themselves in the same way as our English Game-fowl; they grow slowly, feather well, but require a dry situation, well-protected from cold winds. The eggs are small, of a dull light-brown, and the shells are generally thick.

A cock of this breed, mated with a lightly feathered-shanked Shanghai hen or hens, will produce some excellent table fowls, very hardy, and easily fattened, the flesh thereby being rendered rich and delicious in flavor. Though they cannot be said to be very hardy, still in some localities and on certain soils they thrive; and where such is the case, they prove not only an interesting but, being so different in most ways from others, a very enjoyable breed to keep.

The Malay

This is one of the best known, though of doubtful origin, of all the domesticated Indian birds; it is more or less the Indian Game-cock, varying in size, color, and habits as it does, from the high-bred Azeel to *Gallus gigantus*. Mr. Weir has shown that the old fighting shake-bag was in some instances probably partly, if not wholly, what is generally termed a Malay, the name comprehending a large family of bony, tall, sparse, hard-feathered, variously colored fowls.



BIRCHEN YELLOW, 1792

Any tall, large, tight-feathered fowl without wattles, with either a knob, lump, or thick-made pea-comb, is at once called a Malay or Kulm fowl, though the variations in these are numerous. Consequently, those wishing to gain prizes at any of our poultry shows must breed them to certain forms, colors, and standard.

Although long known in England, and probably used in fighting, we have no drawing or picture of one antecedent to that given in Rees' "Cyclopædia" since 1810. In this one sees at once the Malay in England at the time, and with its peculiar form and flowing tail there was but little difference between them and those shown in the early fifties. Marsden observes of the St. Jago cock "that this bird is so tall as to enable it to pick grain off a common dining-table, and that it has the habit when fatigued of resting its body on the hock or hind part of its legs, and in this state is taller than the common fowl." Latham adds, "we have not been fortunate enough to see this bird, but that it must

be a giant of its race can easily be imagined from the figure of a leg of the natural size sent to Mr. Temminck from Batavia, at the back of which is a tremendous spur, two inches in length, and stout in proportion." Here we have the habit and leg-bone of the Fancier's Malay.

"Lieutenant-Colonel Sykes, in his 'Memoir of Birds found in the Dukan (Deccan) States,' states that it is only there met with as a

MR. ASTLEY'S PRIZE AND CUP OLD ENGLISH GAME WHEATEN PULLET

domestic bird, and that he has reason to believe that it is not a native of India, but was introduced by the Mussulmans from Sumatra or Java. The iris, he says, of the real Game bird should be whitish or straw color." (This is the same, or nearly so, of the Azeel, and some strains of the old English Game, and is also the not unusual color of the eye of some of the imported fowls called Langshans.) "The Colonel landed two cocks and a hen in England in June, 1831, and they bore the winter well; the hen laid freely, and by September, 1832, had reared two broods of chickens.

"The cock had not the shrill pipe of the domestic bird, and his scale of notes appeared to be more limited. A cock in the Colonel's possession stood twenty-six inches to the crown of the head, but was said to attain a greater height. The length, from the tip of the beak to the insertion of the tail, was twenty-three inches. Hen one-third smaller in size than the male." (Zoölogical Society Proceedings, 1832.)

Jardine's notes, with some additions, give a true picture of the Malay as known here: "It often stands more than two feet high from the crown of the head to the ground. The comb extends backward in a line with the eyes; it is thick, a little elevated and rounded at the top, and has almost the appearance of being cut off. The wattles of the under mandible are comparatively small, and the throat is bare. Pale goldish-reddish hackles ornament the head and neck and upper part of the back, and some of these spiny; from the bare part of the throat, middle of the back and lesser wing-coverts deep chromes; the webs of the feathers are disunited. Pale reddish-yellow, long drooping hackles cover the rump and base of the tail, which last is very ample and entirely of a glossy green" (this description by Sir William Jardine shows the bird before the modern innovation and peculiar fancy of lessening the tails of all our domestic fowls, and thus much of the green is lost as well as the utility of the tail), "of which color are the wing-coverts; the secondaries and quills are a pale reddish-yellow on their outer webs; all the under parts deep black and glossy green, with high reflection. The rich chestnut of the base of the feathers appears occasionally, and gives a mottled appearance to these parts." Such was the description, and from this even as far back as the teens of the last century there were numerous variations, such as the tufted, the whiskered, and bearded (as now), besides that of form and habit.

The following letter from Singapore, November 12, 1823, Straits of

Malacca, by Beruga Ayam Saborg, is of especial interest, throwing light, as it does, upon the whiskered Malay, etc., and perhaps on our English muffled Game, and more on the Azeel: ". . . having frequently read notices relative to the Malay and Chittagong crosses which appear to me to be erroneous, as the writers proceed on wrong data. One writer

BLACK-BREASTED LIGHT-ORANGE DUCKWING OLD ENGLISH GAME COCKEREL
Owned and bred by Mr. Weir

complains of the muffly heads, another of the great weight and clumsiness of the Malay Game-cocks, which when well bred have very seldom indeed any top-knot, and seldom weigh more than four pounds. The Jungle cock, which inhabits many of the islands in the Eastern seas, is a perfect Game-cock, high on the leg, light fleshed, hard feathers, a fine eye, and the most beautiful plumage conceivable—in fact, a perfect Game-cock.

This bird I look upon as the father of the true-bred Game-fowls. The Malays frequently secure their eggs, hatch and bring them up, or put them in the way of Jungle cocks.

"The English Game-cock has no doubt reached the acme of perfection, but at the same time the Malay birds are equal in blood, as perfect, and even deeper Game of the two. The Chittagongs cannot be called Game; they are large, heavy, and out of all repute as Game. It appears to me very odd indeed how good Game-cocks (Malay) could have been seen in England. The only places which Englishmen, and more particularly captains of ships, are in the habit of visiting, are Pulo Perring or P.W. Island, the entrance of the Straits of Malacca, once or twice a year to the west of the coast of Sumatra, and the island of Java. Now one thing is clear, they have no cocking either in Java or P.W. Island, consequently no good cocks. On the west coast there are some, but not what the captains of ships would get by asking for (*i. e.*, if good). The majority of importations have been most probably made by men who scarcely knew a cock from a goose, often bought in the bazaar or market-place, where good Game are not to be procured, for they are never exposed for sale if worth having. I have myself seen worthless dunghill cocks sent to England as fine savage Game-cocks; by this means no doubt their credit is sullied, and that muffly heads, top-knots, clumsiness, dark skins, etc., are raked up against them; but it certainly arises more from the kind of bird called in England a Malay Game-cock than from the actual bird itself."

It appears from Mr. Saborg's letter that the high-class Malay is small, and is most likely the one we now term Azeel; and this view is borne out by the opinion of others, who put the lesser bird as the one of the highest class. Yet, nevertheless, the larger is the one known as the Malay, and the Azeel is of later importation; and though of fine quality in all respects, still there are lovers of the old Kulm or Malay—the Giant.

The wings of the Malay should be long and carried high, almost touching over the back, with powerful shoulders, and be large in girth, breast-bone somewhat long with strong-made keel; the breast meat hard, muscular, and well-developed, flesh firm in grain but rather inclined to be dry, as the Malay does not fatten well on the breast, the angle part of which generally shows red in flesh between the feathers. Captain Robert Buller Young informed Mr. Weir that the ordinary fighting-cocks of India are Malays, and that the general term is Indian Game, but is totally

distinct from the Azeel, and that pointed steel tips, or blade spurs, are used in the fighting. The natives of Java and the Malayan Archipelago are the most noted cock-fighters of all the Asiatics. The Malay is in India called the Callum or Kulm fowl. The number of Malays that are continually imported from India, Mauritius, the Philippines, and other places, of varied forms and colors, give a wide opportunity of selection; thus it is that some are exceedingly tall, while others are lower and more square in body, more sturdy, and much less liable to leg weakness.

The Malays now exhibited are in no way superior to those of half a century ago; some perhaps may be a little taller, one being said to be over thirty-three inches, but whether this is an improvement is a matter of taste and opinion; for utility, the shorter-legged birds are the more hardy and in all ways more preferable. These and the so-called Cornish Indian are almost identical excepting in color, the latter being formerly known as Pheasant Malays. The Malay is a cruel, long, and persistent fighter, but lacking entirely the fire and dash of the English Game-cock; there is a sort of cool, old hidalgo, stately mode about him that is not found in other Game birds, and this renders such as he a troublesome adjunct to a farmyard where other cocks are kept.

In the *Gentleman's Magazine*, as far back as 1770, it is stated that "The inhabitants of the islands to the eastward of Bengal, such as Sumatra, Borneo, and the coast of Malay, are very famous for cock-fighting, in which they carry gaming to a greater excess than the customs of Europe can admit. They first stake their property on the battles; these lost, then their money and effects; these gone, then their wives and children."

In Sumatra they do not trim their cocks for fighting, as was the practice in England and is now in America, Spain, France, and Belgium. At Manilla, in the Philippine Islands, cock-fighting is regulated by law, and has been taxed since 1779. It is only permitted, under a code of regulations, on Sundays and Feast days, at places officially designated for the meet of the combatants. The cock-pit is called the "gallera," and the tax is rented out to the highest-bidding contractor, who binds himself to pay a fixed sum per annum. The laws of the cock-pit are very strict.

In the French colony of Martinique cock-fighting is still a national sport, which usually takes place on Sundays. Malay cocks are used, and they fight with their natural spurs, which are sharpened for the purpose by the setters, who suck the spurs afterwards to show that they are not

poisoned; the plumage is then ruffled, the limbs are moistened by passing them along the setter's open mouth, and the birds are then put down

By permission of the proprietors of the "Field"

CUSTARD DUCKWING OLD ENGLISH GAME, 1853
Owned by Mr. Thurnall

for combat. The Malays fight their cocks with only one spur. It is like the blade of a penknife, only more curved. Sometimes, but seldom, artificial spurs made of horn are used.

There are white Malays or Game in India—pure white, white beaks, shanks and feet, with pearl eyes; but they have not been imported, those in England having yellow skin, shanks and feet, with the lightest of a light primrose tint pervading the plumage.

As layers they are not good, the eggs generally being small and of a dull color. Their numbers are few, besides which they lay only during the spring and summer months. On dry soil the Malay thrives. It can be bred and kept like the Azeel in small enclosures, even in the heart of towns. The chickens are hardy but slow in feathering, and require warmth also when moulting, as much as good feeding, the thin skin and lean

breasts not producing oleaginous matter and other requirements in sufficient quantity to give the necessary moisture for the proper feather growth. After the chicks have their heads covered all goes well, but both the young and old are subject to leg weakness, especially in cold or wet weather. One noticeable peculiarity is their manner of resting on their hocks (heels) and shanks, the body being somewhat upright; but this is the habit of most long-thighed, long-legged and long-shanked fowls, as witness the modern or Club Langshan. Whether the Malay proper will ever regain its former position in public favor is a moot point, although an offshoot under the appellation of the Cornish Indian is held by some—at least, for the present—in considerable estimation; but how long this will be so only time can determine.

The Indian Chittagong

Is what might be generally termed the Indian barn-door fowl, being a mixed kind and of various sizes, forms, and colors, some partaking of the Azeel character, others of a Malay cross with a semi-Dorking appearance. Captain G. Buller Young's experience with the Chittagong is as follows:

"During the latter part of the sixties and the greater part of the seventies I was stationed at Point de Galle in Ceylon, then a garrison town and the main port of all our mail steamers, and a calling port for vessels from many parts of the world, being a coaling station as well. It was during this period that I gained my knowledge of the Chittagong fowls. They used to be brought over in the native rice-laden vessels and allowed to run loose between the decks on the bags of rice; consequently they landed in Galle quite fat, and in such quantities that they were hawked from door to door, and also brought to the port, so that I had many opportunities of purchase. The fattest and biggest cost one shilling or eighteen pence each, the cheaper ones being bought by the dozen.

"The Chittagong is a mongrel breed of fowls that have been perpetuated in the locality of Chittagong and the surrounding districts for generations, possibly from the fact that most of the inhabitants are Mussulmans; though, with the upper classes of the Hindoo fowls, are an abomination, and the rearing of them studiously avoided.

"The Chittagong is of various colors, much the same in this respect

as the English barn-door fowls, and in size would compare with a small Dorking or Leghorn. The combs of the cocks vary in size and shape; there is the single erect comb, the 'rose,' and the short stump like the Malay, with rather full but small wattles. The crow of the male bird resembles that of the English, but is shorter; the hen cackles when she lays eggs; in color the eggs of larger kinds are of a dark smoky-brown, with a

BLUE-BREASTED DUN OLD ENGLISH GAME COCKEREL

most beautiful plum-like bloom when just laid. The chicks are rather slow in feathering for about the first six weeks, especially on the shoulders

OLD ENGLISH BLUE-BREASTED BLUE GAME COCKEREL
Aquarium Fishery Show, 1892

and rump; the young cockerels are pugnacious and fight courageously, often until blinded.

"One curious complaint from which these and other fowls of the East suffer is smallpox." (This is rare in England.) "The adult birds

are fully, not to say abundantly, plumed, and the more scanty the feathers on the growing chick the stronger the assumption that it will be a big fowl—'budda Murghi,' in Hindustani.

"The hens are not prolific, usually laying between eighteen and twenty-five eggs; and it is the native belief that if untouched by hand they will produce about the same number of chickens, with rarely more than two or three failures. But it is always better to set the eggs of a well-developed and matured hen than the first eggs of a young pullet; in point of fact, in the East this is an invariable rule, and I can from actual experience prove the correctness of the surmise. Taking the Chittagong as an 'all-round' bird, I have no hesitation in pronouncing it one of the hardiest and most easily reared of any in India. It is quite a poor man's fowl as well. The expense of production is small, and if properly looked after the profit is considerable.

"The Chittagong is a clean-shanked fowl, having no shank feathers. As to size, there is as much difference between the true Malay and a Chittagong in height, etc., as there is between a Dorking and a Bantam, the Chittagong being nothing of the size of the Malay in bulk or height."

The Australian Game-fowl

This is another variation of the Game or fighting type of fowls. With all poultry, the cocks more or less have a combative propensity, some to the death of one or occasionally that of both, while with others there is knowledge of when they have had enough, and they suddenly end the battle by a somewhat hasty retreat, perhaps being possessed with the idea that discretion is the better part of valor; but no craven is respected, or should be, and thus it is that the warrior tribes of our poultry, both by their daring and courage, as well as their high and lofty mien and generally acknowledged beauty, are considered not only to be the blue blood, as it were, but rank as much above the common as the racer does above the slow, slaving cart horse. Thus it is that the Australian Game-fowl, though a new combination, already has many friends.

"The origin of this fowl," says a writer in the *American Fancier* of September 8, 1897, "rests solely with the Malay and the old-style British Game-fowl, but being bred to an ideal for so many years it has now become a definitely fixed breed, often being exhibited of immense size (it is a common occurrence for cocks to scale twelve pounds, hens ten pounds).

As a table fowl they are, *par excellence*, of extraordinary hardy constitutions, easily reared, and thoroughly suitable to our trying climate (Australia), with beautiful hard, short, lustrous plumage, and possessing great physical beauty. They combine the great reach, strength and size of the best Malay with the magnificent plumage of the old-fashioned Game-fowl; however, not being nearly so coarse-looking or angular as the former, nor nearly so feathery as the latter, they find great favor on all sides for their economic qualities, which are of a very high order."

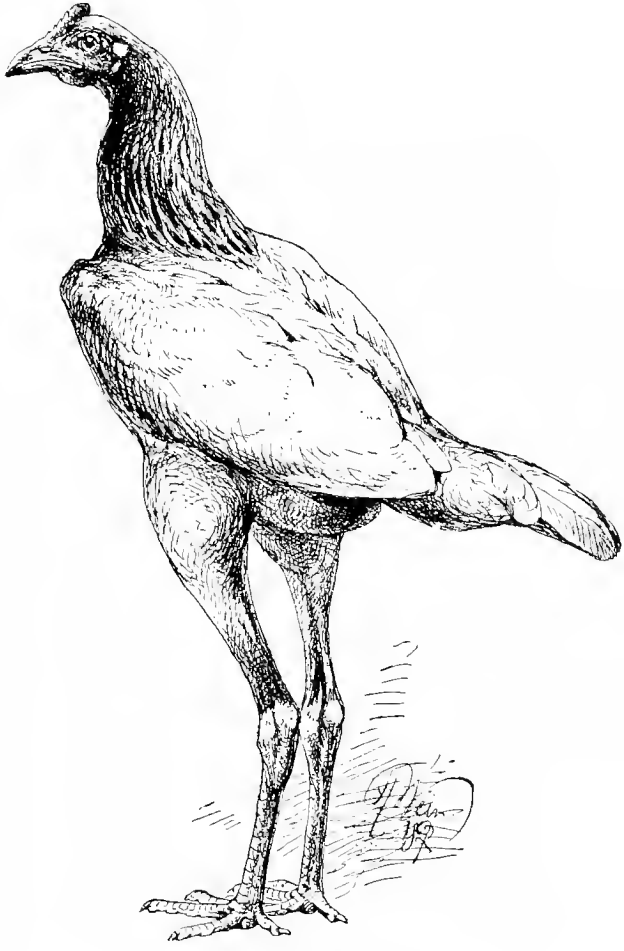
CROSS BETWEEN MODERN GAME AND OLD ENGLISH GAME
Owned by Mr. Flecher Moss

Mr. Weir says he can offer no opinion further than that in England, both in the past and the present, the Malay pure and simple has not been thought a desirable cross with the old English Game. When such has been tried, it has generally proved to the disadvantage of both breeds, being from its size a shake-bag of an inferior quality in all respects. Still, the hearsay reports, as well as those from actual observation, are highly favorable to the new comer; and judging from these there appears to be a brilliant future for the new-made breed by the poultry fanciers. Daily we are told that the gallant beauties are becoming more beautiful and perfect, and their coloring brighter, their forms more compact and shapely; that they breed truer and more true, and they may now be fully considered

to have maintained if not surpassed their newly acquired fame, and thus among the many of our poultry varieties have established a right to recognition.

Cornish Indian, Miscalled Game

This breed is said to have been first exhibited at the Crystal Palace and elsewhere in 1858–59 in the classes for "any other breed," and at once attracted attention, besides being the winners of prizes and commendations. Later, at another Crystal Palace Show, Mr. Weir handled a cock and hen both surprisingly heavy, considering their size and appearance. One old poultry breeder remarked that they had so much meat on their backs as to be what he should call "double-breasted." These were shorter in the leg and shank than the present miscalled Indian Game—more square and compact. Here is a description given at the time by Mr. J. Lloyd: "Their peculiarities consist in the tail being set on in a horizontal position in a similar manner to the pheasant's, so that the saddle hackles fall over and mix with it, this fowl being the only one I know that is unable to elevate its tail. The feathers on the head have all the



MODERN GAME HEN

appearance of being brushed up so as to meet at the crown. The comb is something similar to the pea of the Brahmas, but more elevated behind. In color the cock is a mixture of green, black, and dark red; the hen is rather of a browner tint; both have a strong metallic lustre." Mr. Lloyd further notes its pheasant-like ways and mode of action. Evidently they partake more of the character of those known as the Azeel. The birds exhibited were decidedly more like Azeel than the Cornish-bred Indian of the present time, which often resembles the Malay so closely that one of each breed might easily be picked out of the same brood, yard, or run. In fact, cases have been known where birds from one brood have been sent for exhibition in separate pens from the same breeder, and have won both in the Malay and the Cornish-Indian classes.

There is little doubt, if any, in the mind of Mr. Weir that the present form of bird emanated from a cross between the Pheasant Malay and the pheasant-breasted old English Game, or the latter with a pure Malay. He has seen them pure black with orange shanks and beak, and of an orange-colored ground, marked on the breast and sides with black precisely of the same half-moon form as the pheasant's, as was the old Pheasant fowl and the pheasant Game. Of the same clutch of chickens have come cockerels of a bright blood-red with black tails, while the pullets were of the same deep red with black hackles and tails. In both cases the shanks and beak were yellow, while others were of a deep red or bay color, with laced markings with an inner lacing; but these are not nearly so bright in appearance as the single-laced variety, though the last, for the present, is preferred by the fancier.

On damp ground Mr. Weir has found them to be delicate, subject to leg weakness, and inclined to colds. Some are said to be fairly good layers; but with the exception of the Azeels and Malays, they are nearly if not quite the worst domestic fowls for ordinary use. In size and color the eggs closely resemble those of the Malay.

For a considerable period the breed was generally known as the Pheasant Malay. At the Crystal Palace Show in 1896 the Malay and the Indian Game classes adjoined. In the pens next to each other stood a cockerel of each said-to-be-distinct breed. One of the best fanciers of the day, considered one of the keenest and most unbiassed observers, looking toward them said, quietly, "Which is which?" They have the leg weakness peculiar to the Malay, and the long shank and "the big bone" which so many

GAME-FOWL DURING THE TRANSITION PERIOD

now insist on having. The points of difference, then, between them and the Malay have been mainly in the coloring and markings, but these existed when they were the Pheasant Malay in an appreciable degree. Had this name been retained, little could or need have been said as to their nomenclature. But to call them Indian Game is a misnomer. It is

foisting them on one of the oldest breeds in the world—one that was in full possession, and the rightful possessors, of the name of Indian Game, now known as the Azeel, the pit-birds of India. They were of wonderful and lustrous beauty, of lengthened pedigree, and of such value that it has been said that a lac of rupees has been refused for one cock. These are the true, the real Indian Game-fowls; but these Cornish, which Enoch Hutton said "may be fairly called English," are not, and have made such reputation as they have by being "boomed" under a false name, as an inferior article is sometimes imposed on the unwary public under a trade-mark not its own.

Origin of Cornish Indian

Here is what a friend of Mr. Weir's says regarding the breed: "The true Indian Game-cock has a history ages before any record can be found of the English Game-cock—of which Englishmen are so justly proud. In England the Indian Game-cock has been known and used, where, as well as in his native land, he has proved himself the gamest of the game. But it is with the spurious breed, not Game—which modern fanciers have manufactured and named Indian Game during the past few decades—with which we have now to deal. If a multiplicity of names was any criterion of their merit, then would they be the most valuable fowl, as they have been known by the various cognomens of Injees, Indians, Pheasant Malays, Spotted Malays, Malay Game, Himalayan Game, Cornish Game, Indian Game, and Cornish Indian Game (where is Cornish, India?); and probably there has been even more diversity of opinion as to their quality, classification, and origin than even as to their correct nomenclature, for while their admirers laud them to the skies as the most profitable and best table-fowl on earth, their detractors brand them as the most worthless, producing very few eggs, and a long, lean, though plump breast, close-grained yellow or yellowish skin and flesh; in addition to the large quantity of food they consume, which produces immense bone and inside fat, mere worthless offal. Exhibitors assert that they are Game; the votaries of the sod, both here and in America, prove them the most abject cowards that ever crowed in a cock-pit. Interested fanciers claim that they are a pure breed imported from India by Colonel Gilbert. Sportsmen who have had the most extensive experience with Game-fowl in India declare such fowls are totally unknown in India; while those who know

their origin also know that they were first bred in Cornwall from a cross between two distinct varieties of fowls which Colonel Gilbert never saw. Neither did he take any interest in nor import any other breed of fowls except Game or Azeel.

MODERN GAME COCKEREL

"'East Indiaman' was the term usually applied to any of that magnificent class of ships formerly engaged in carrying on the trade of the old East India Company, and Falmouth being the first port on entering the Channel, they usually waited there for orders. Those Indiamen, locally pronounced 'Injeemen,' frequently had on board strange and new birds and beasts from the East, among which were fowls, mostly of the Malay type, and often very good Malays, too; but whether shipped from the Bay of Bengal or the Philippine Islands, or black, white, red, or gray in color, they were termed 'Injees' or Indians in Cornwall, from the name of the country they were brought from, although the officers and crew often called them 'Chittagongs,' the word Malay, or the new term Azeel, as applied

to fowls, being quite unknown or unheard of in Cornwall until the advent of poultry shows. Not only were there a large number of these fowls (Injees) kept in the Falmouth district, as stated by the author of a modern poultry book, but their short feathers, large size and immense bone induced many breeders of Game-cocks in other parts of the country to cross them with their own Game-fowl in order to obtain additional strength and bone. The produce of this cross between the 'Injee' and true Game were simply termed 'Injee' and 'Game,' which, shortened, became perverted into 'Injeegame,' or Indian Game; and perhaps the handsomest birds ever produced by crossing our pure Game-fowl with those Injees (more correctly Malays) were those bred from the celebrated white cocks of Captain Maunsell, of Falmouth. These active, elegant cocks had not only won a local reputation second to none in the county, but for many years after the Truro cockpit was closed (it has very recently been converted into a spirit store) fought in the crack mains in London with equal success. They were 'smock-breasted white' cocks, with bright yellow legs and beaks, perfect in symmetry and shape, and so wary, fast and furious in fighting that their battles were generally short, sharp, and decisive when crossed with the 'Injee,' like all other Injee crosses."

From a drawing by Harrison Weir

GAME-FOWL CHICKS

First Appearance of Spurious Indian Game at Shows

"Their produce proved worthless as they were not Game; but those who saw them in the pens of the first large poultry shows will not easily forget their pure white feathers and stately forms. They were the admired of all admirers, and a grand future lay before them had it not leaked out that they were not Game, followed by the assertion of Anglo-Indian sportsmen that such fowls were unknown in India; and as poultry shows were introduced for the avowed purpose of improving pure-bred poultry, purity of breed in a prize-winner was a paramount consideration at our early shows. Consequently inquiries were made by the secretary of the Cornwall Poultry Society and others as to their origin, when that excellent naturalist and friend of Yarrell's, J. J. Tratham, C. E. Rook Hunt and other breeders sealed their doom by frankly owning that they were a cross-breed variety between white Game and Malay, *alias* 'Injee.' Banished from the show-pen, useless for the pit, hard and dry in flesh, and, compared with English Game, worthless for the table, they became neglected, and at present they are nearly if not quite extinct in Cornwall. But years before this white Indian and Game cross had been tabooed, or even appeared in the show-pen among other colors of the same cross, the Pheasant Malay had been produced by the noted Sam Diamond and his trusty friend Joseph Clemens.

"Those who purchased them for the pit soon proved they were a fraud; those for the table found them coarse, hard, and dry, and of inferior quality compared with the excellent Game-fowls then in the Cornish markets —so much so that the higglers refused to take them except at a reduced price: thus they quickly became unpopular; and Mr. Palmer, who has kept them more than forty years, recently stated, in an excellent article in a poultry paper, 'that at one time they had nearly become extinct.'" Then it was that by dexterous manipulation, here and there letters of praise and advocacy, vaunting them as having qualities of excellence which they had not and never have possessed, they were, to use an expressive American phrase, "boomed." Like the Cochins and the Brahmas, all that could be said in their favor was said, and more than should have been, for many were thus induced to buy. Some not only kept them awhile, until their deficiencies became apparent, but also unwisely crossed them with such breeds as the old Kent, Sussex, and Surreys—this not only hardening

From a drawing by Harrison Weir

PRIZE MALAY COCKEREL

the breast meat of these superb table fowls, but also lessening to a marked degree the fine quality they possessed of fat distribution over and above the pectoral muscles. There was further deterioration in the way of long thighs and legs, frequently with yellow or horn-colored shanks, yellow

flesh, skin, and fat. "Thus this Malay cross," says Mr. Weir, "through the tact of some and the reckless advice of others, has caused and is causing more permanent injury than can possibly be imagined to our best table fowls."

An American Point of View

One of the most experienced poultrymen in America on Games is John Glasgow, of New Jersey, whose comments are as follows:

"Reading from an American standpoint Mr. Weir's several chapters on the Game-fowl, the reader need not be told that the author is an old-time cocker and breeder of Game-fowls for the pit. He exhibits considerable bias in favor of the old English Game in comparison with what one is accustomed to call Standard, Modern or Exhibition Game at the present day.

"The writer of this criticism is also an old-time fancier of some forty-five years' standing, and the first Game-cock he ever owned, when a lad of fifteen, was a brassy-winged black, of the old type and of a famous fighting strain, in a mining district of western Scotland. About this period or shortly afterward a ban was put upon cock-fighting in England, an act of Parliament being passed making it a punishable offense to engage in cock-fighting. Mr. Weir claims that a standard existed of what the Game-cock should be, at the time when what he terms the 'new breed' was launched on the fancy, *viz.*, the modern Game-fowl—and had been bred to, from time without date. This may be so in regard to formation of body characteristics, but could not possibly be so as far as feather property and colors went, because not one cocker in a hundred cared a fig for colors, and does not now. Through crossing of strains that were known stayers and good fighters, irrespective of colors, the progeny of a single mating would come of a variety of colors, not only in plumage but in color of legs as well.

"The advocacy of the old-fashioned in comparison with the modern Game-fowl by Mr. Weir is past my comprehension. That there is any comparison in points of beauty between the get-up of a fighting Game and the 'race horse' of the feather fancy, the modern Game, I candidly confess I cannot see. There is just as much difference as there is between that of a prize-fighter and a blue-blooded aristocrat. This even Mr. Weir admits where he says, 'in the hands of a few keen, clear, thoughtful, and

strongly practical men the new variety stands forth in the new fashion, form and dress, a thing of beauty.'

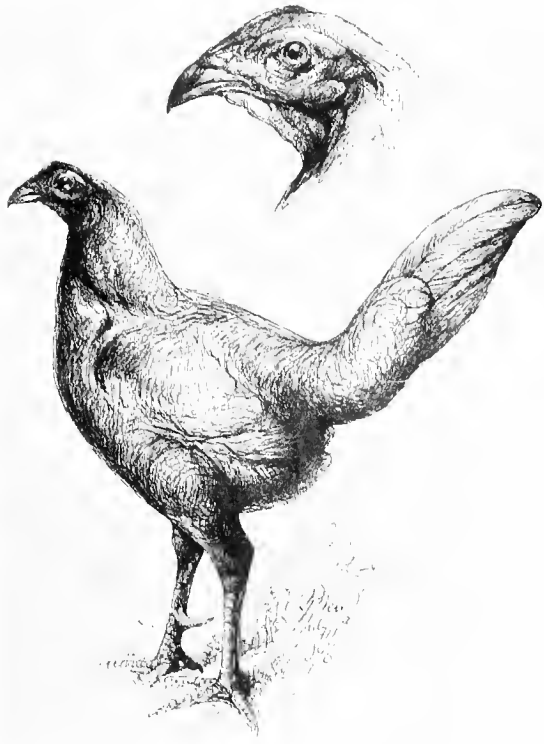
"To evolve this 'thing of beauty' to the high perfection it has attained is a monument to the men to whom we are indebted for it. Although Mr. Weir mentions Captain Heaton, Ainscough and Brierley in particular, there is no man living or dead in England to-day who has brought to bear more skill in perfecting the aristocrat of the feathered fancy, 'the lordly modern Game-fowl,' than George Furness, Hugo Ainscough's present manager, who exhibits birds in such superb condition.

"Mr. Weir makes much of the supposed advantages of the extra-sized tail and hard, well-developed feathering of the old-fashioned Game-fowl. If of so much advantage, I should like to know why 'cockers,' when preparing to fight their champions, divest them of the flowing neck-hackles, tails and wing-feathers before going into action?

"The modern Game-fowl is harder by many degrees, in feather and flesh, than any old-fashioned Game I have ever handled, and in general formation more symmetrical. That they are a difficult fowl to breed to perfection is to be admitted. There are lots of weedy specimens raised every year; so there are of every variety of fowls in existence, but that is the fault of the breeders and not the variety, and only adds zest to their operations. Some fanciers, as a rule, are as game as their birds and make up their minds to conquer. That the modern game is inferior to the old-fashioned Game as utility fowls I do not admit. A good judge of a modern Game has no use for spindled-shanked specimens either in England or America. They want a well-developed thigh, plenty of bone, and not, as Mr. Weir asserts, 'weakened, stilty, thin, stork-like legs and thighs with shanks to match; and the more slender these are the more a lessening section of fanciers prize and value them. When killed and trussed as table fowls, these thighs and legs make a fleshless, ugly show.' This statement is at variance with facts, as our best breeders can substantiate. There is no plumper, short-fleshed, juicier fowl in existence than the modern Game; or one carrying less offal for weight and flesh—not even the old-fashioned Game-fowl.

"The reason why there are so many weeds exhibited in the modern Game classes in England is because exhibitors send out their youngsters to shows long before they are well matured. As a consequence, they undermine the constitution of the bird to such a degree it never makes

the development it otherwise would. You don't find such breeders as Captain Heaton or George Furness following that plan. Moreover, they would not think of mating up a specimen that has a tendency to a weakened constitution; hence the success they attain at the principal fixtures, such as the Palace and Birmingham shows, against all comers. That the fighting or old-fashioned English Game as exhibited at English shows are counterparts of the same variety as they were fifty years ago I am not prepared to admit. I remember well about thirteen years ago, when clubs were formed to resuscitate an interest in the old-type Game-fowls.



OLD ENGLISH BLACK GAME HENNY COCK
Owned by Mr. Weir

"They were altogether too fleshy and soft to handle, and lacking in the characteristics of the Game-cock of half a century ago. They may have improved since then for aught I know, still I hold the opinion that the show-room is not the place to adjudge the qualities of a fighting Game-cock. The only place is in the cock-pit. As the fighting of Game-cocks is a cruel relic of the past, and punishable as an offense in nearly every civilized country, all self-respecting, law-abiding citizens should set their faces against it and use their birds exclusively for domestic purposes, either pure bred or, better yet, as a cross on some other pure breed.

"The commercial value of the old-fashioned Game as compared with modern or exhibition Game, either in England or America, is very striking.

It will be a long time before a hundred guineas (a little over five hundred dollars in American money) is paid for an old-fashioned Game. That sum is by no means a record one for an exhibition or standard modern Game in England."

From a photograph

CORNISH INDIAN COCKEREL, 1892

CHAMPION MODERN GAME

Owned by Captain Heaton

BLACK-BREASTED RED TRANSATLANTIC
The winner of three battles. Bred and owned by Dr. Clarke

ORIENTAL GAME FOWLS

DR. H. P. CLARKE, INDIANA

Who is he who sets the world in motion, the holy, strong Sraosha, a mighty-speared and lordly god? It is the bird named Parodars, the cock that lifts up his voice against the mighty dawn.—VENDIDAD, ancient sacred book of the Parsees.

SO DIFFERENT are these birds from every native European race that one can scarcely think of them without being brought to consider the whole subject of the origin of domestic poultry. The old idea that all fowls are direct descendants of *Gallus bankiva* is not tenable when one knows the nature of this Oriental type, its prepotency, and the persistence with which it reproduces its kind under varied climates and conditions. It may seem almost incredible that the Game-fowl of England could be more closely related to the feather-legged Shanghai than either is to the Aseel of India, and yet there is apparent testimony to this effect.

The statement of early authors that all domestic breeds tend to revert to the Bankiva type does indeed hold good of European and African races, and also of many Asiatic varieties, but think of the Game birds of Brazil,

which have been raised and fought there for at least a century and are stronger in Oriental features to-day than our exhibition Malay.

By courtesy of Dr. Clarke

SHAMO JAPANESE GAME

The Shamo of Japan is well known as the very acme of Orientalism, and the fowls of Madagascar, referred to in the next chapter, bear even greater evidence that this Oriental or Malayoid type is a natural and not an acquired one.

Lack of time and space forbids full treatment of the subject here, but let us briefly consider a few points. American soldiers who have been stationed in Mindanao and Jolo say that the natives of those islands are too lazy to raise poultry, so they tame and pit the jungle cocks, and that these wild cocks are absolutely game during the breeding season—that is, they will fight to the death in either natural spurs or steels. These fowls of the southern Philippines are closely akin to the Bankiva and Sonnerat of India, also game cocks, and doubtless all descended from one common ancestor, for the peculiar feather-formation of the Sonnerat offers but few difficulties to a naturalist. That remote ancestor, or possibly the immediate parent of

present-day Bankiva, must have been the progenitor also of the Old English Game and other European races, the genuine Game being the only real thoroughbred which has retained its original type and courage, the dunghill races having lost their primitive traits through degeneracy in domestication.

Now having noted the probable antecedent of the Old English, and having observed that a domestic game-fowl, even such a bird as the Flemish, differs but little from its primitive wild type, we are led to the conviction that the present existence of a game Aseel almost certainly indicates that some such fowl as that described by Temminck under the name *Gallus giganteus* did once live in the wild state. There are only two real arguments against this theory: one is the fact that all domestic fowls are fertile when bred one with another, which seems to be fully explained by the well-known "Pallasian doctrine" exemplified in the feline and canine tribes, viz., descendants of species which, when first domesticated, would, if crossed, probably have been in some degree sterile, become perfectly fertile after a long course of domestication.

Photograph by courtesy of Dr. Clarke

AN AMERICAN GAME-COCK, WITH JUST A TRACE OF ORIENTAL BLOOD

The other, and the one upon which Darwin rested his belief, is the

fact that no such wild fowl has ever been found, and its extinction he considered "an improbable hypothesis, seeing that the four known species have not become extinct in the most ancient and thickly peopled regions of the East." But reasoning from analogy, and going upon the theory that Old English Game as closely resembles Bankiva as the Aseel or the Shamo Jap does its own wild prototype, let us try to picture the primitive Oriental. Think of the short wings and heavy build, and consider whether after all it would not be "an improbable hypothesis" to expect such a wild fowl to survive "in the most ancient and thickly peopled regions of the East." Would it not rather have been a matter of wonder if such a fowl in the wild state had failed to go the way of the dodo and the great auk?

Returning to the subject of classification, it will be found that all domestic fowls, both game and dunghill, may be grouped under two headings or distinctive types, one of which for convenience sake we will call the Bankiva, the other the Malayoid or Oriental. Game fanciers sometimes recognize a third, the pheasant* type, but this last is generally thought to be either a slight variation from the Bankiva or the same with a small infusion of Oriental blood. It embraces such varieties as the Minoshki of Japan, our old-time Sumatra, and some of the slasher fighters of the Far East as illustrated in the "Ayam Jallak" of Wright's first edition.

The Chittagong of India, named after a city near the mouth of the Brahmaputra River, is the common farm fowl of that country. In blood it may be considered a grade Aseel, strongly Oriental in features, though without any fixed character of form, size or plumage. The fowl known in England and the United States as Malay is simply a standard-bred Chittagong, its present perfection and uniformity being due to British art rather than to anything East Indian. It is not an original or pure breed, but very distinctly Oriental, and consequently quite different from all European and from many Asiatic varieties.

Mr. Weir appears not to distinguish between the Malay and the Malay Game. The former is a heavy-weight farm fowl or show bird of strong Oriental features. The latter is a light-weight fighting fowl, not Oriental,

* In America the term "pheasant" refers to shape and carriage, in England to color of plumage This difference in usage is what caused Lewis Wright to confuse the Pheasant Malay with the Sumatra Pheasant, two varieties quite dissimilar.

but rather pheasant type. The birds mentioned as being fought at Manila and those described by Mr. Saborg are evidently Malay Games, not Malays.

English fanciers are in the habit of referring to Aseel as "the true Indian fighting-cock," and the expression is perfectly correct as applied to the north of India, in the region of Patna, Cawnpore, Lucknow, Agra, and Delhi. But there are other varieties of fighting-fowls in other parts of India, and some of them quite unlike the bird we now know as Aseel. "India Game," as they were formerly called, have occasionally appeared in this country since long before the poultry show era, and it may be possible that some of those early importations were of Aseels. The first birds brought to the United States which actually bore this name were imported by the writer some seventeen years ago. They did well in our climate and proved quite a valuable acquisition; too slow when bred pure, but of great value for crossing, and the blood may now be found in several of America's most successful pit strains.

Photograph by courtesy of Dr. Clarke

JAP-ASEEL CROSS

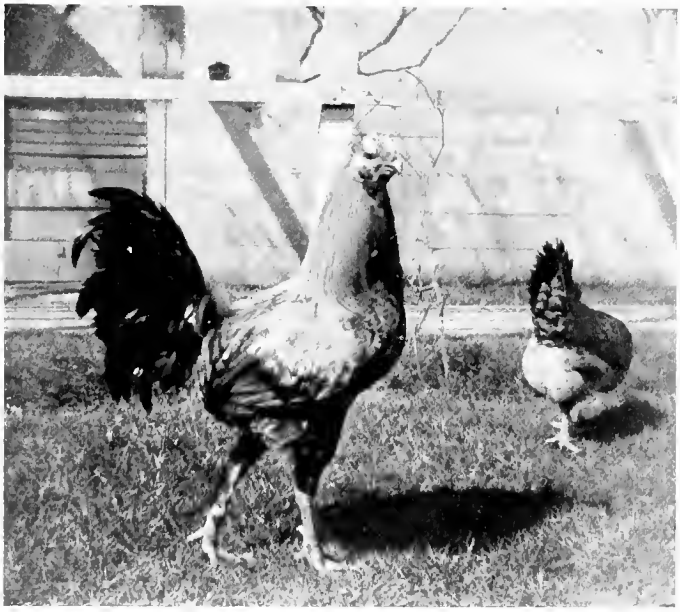
How strange it is that almost every author who writes on the subject of Cornish Indian tells a different story as to the fowl's origin, and stranger still that nearly all these stories may be correct, for the truth of the matter seems to be that the modern Cornish, like the White Plymouth Rock, came from several sources. Similar birds exist in the Deccan. This has been denied by some English fanciers, but it is noticeable that "Poultry Keeping in India" (a very pretentious cloth-bound volume lately published at Calcutta) uses a number of old British and American cuts of Cornish fowls to illustrate "Hyderabad Game." Many of the crosses named by poultry authors contain too large a proportion of real game blood, and this fault may be found with some of the statements given by

Mr. Weir's informants. The disposition and soft feathers of most modern Cornish would seem to indicate a mixing with something rather more on the order of the Langshan or Dorking.

Our new American Standard credits the Cornish with being composed of Derby, Aseel, and Black Sumatra. The trouble about this is that a mélange of five-pound birds could hardly turn out ten-pound offspring, and the Sumatra was not known in England at that time anyhow. The sum of it all is that if you mate a laced Aseel cock with hens of almost any large-sized smooth-legged race you will be able to pick some Cornish out of the progeny. Birds more or less of this character have been known in the United States for many years, but the first true Cornish were introduced to the American public at the Indiana State Fair in the autumn of 1887, and next exhibited at the Indianapolis Poultry Show in January, 1888.

CORNISH INDIAN COCK

FOWLS KNOWN AS "FIG-PUDDING," OR "PLUM-PUDDING" GAME FOWLS.
BUT MORE PROPERLY "ALMOND MOTTLES."



From a photograph by Dr. H. P. Clarke, Ind.

FLEMISH GRAY STAG AND COMBATTANT DU NORD HEN

Owned by Dr. H. P. Clarke, Indiana

GENERAL REMARKS ABOUT GAME-FOWLS*

DR. H. P. CLARKE, INDIANA

Leporem et gallinam et anserem gustare fas non putant: haec tamen alunt, animi voluptatisque causa.—DE BELLO GALLICO.

A CASUAL reader of the ordinary poultry paper might form an idea that there were not many Game-fowls in this country, but after learning of the six monthly journals and one weekly publication devoted exclusively to Game he would begin to realize that this branch of the fancy forms a little world all to itself. There are several distinct breeds of Game-fowl, and almost as many sub-varieties as there are non-Game kinds in the Standard. The pure American Games, as distinguished from crosses of the Jap and Aseel, are mostly made up from Irish, English, and Spanish elements, the proportions being probably as in the order

*In this chapter, Dr. Clarke, one of the closest students of Game-fowls in America, has covered the subject in a general way. He has touched matters of special interest to all breeders and fanciers in this and other countries.—EDITOR

named, for the land of "Kelly and Burke and Sheay" has contributed to us much of its fighting blood in cocks as well as men.

By courtesy of Dr. H. F. Clarke

GRAY THREE-QUARTER TRANSATLANTIC
A four-time winner

The "modern" Game of Great Britain is rapidly passing from view in its native home and being replaced in poultry shows by the Old English. This same trend of the fancy is becoming apparent in the United States, and possibly by the time the American Poultry Association is ready for another revision fanciers may be clamoring for the Pit Game standard which was adopted and afterward thrown out by the American Poultry Association at Indianapolis in 1888.

The Transatlantic fowls shown in the accompanying illustrations are descended from, or closely related to, the first-prize pen in the Pit Game class at the World's Fair, Chicago, in 1893, and are of the same breeding as the first pen at the Pan-American Exposition.

Belgian

There are in Belgium three distinct varieties: Flemish, Liége, Bruges. The "Flamand," as it is called in French, is the steel-spur fighter of West Flanders and Hainaut. Cocking is prohibited in Belgium, and as a consequence no publicly advertised mains are held, but that historic borderland which Napoleon called "The Cockpit of Europe" is alive with fighting fowl. From Mons and Mainvault; through Tournai and Templeuve—*i. e.*, *Templum-Jovis*, a relic of the Roman times; Courtrai of the ancient prison; on, almost, to the city of Bruges, whose belfry our own poet Longfellow celebrated in verse—throughout this whole region, in fact—cock-fighting is the common pastime of the people, and the number

of birds used in small mains and private matches during each year is something enormous.

Nearly all colors are to be found, but light and dark grays are the most common and apparently bred to the highest point of excellence. Many elegant mottles, blues, brass-backs and reds are also seen. Fowls have single combs, and are heavily feathered, with long wings and full tail. Cocks usually weigh between eight and ten pounds, and are very active, considering their size—much more so thanBritish Game of even approximate dimensions.

Closely related to the preceding, and, indeed, differing but little except in such points as naturally distinguish a naked-heeler from a steel fighter, is the *Combattant de Liege*, or *coq du pays*, as it is commonly called in the north of Belgium. The fashion there is to match cocks in natural spurs. Little circular straw pits about six feet across are set up at almost any convenient place, two birds are thrown in, and the fun commences. Liége, Hasselt and Tirlemont are centers for this kind of sport, and much of it may be seen in the old Flemish town of Borgerhout, a separate corporation, although inside the fortification walls of Antwerp, and to be reached by street-cars from the old cathedral where hangs Rubens's most famous painting, "The Descent from the Cross." These cocks average about two pounds heavier than the *Flamands* and are slower in action, stronger, tougher, and more rugged. Common colors, dark red, iron-gray, blue-red.

Photograph by courtesy of Dr. H. P. Clarke

BLACK RED TRANSATLANTIC
Owned by John T. Maunder, of Ontario, Canada

The name Bruges is sometimes applied by poultrymen, seldom by cockers, to both Game varieties of northern Belgium. Strictly speaking, Liége is the true pit-fowl and Bruges the Malay-cross exhibition bird. They bear about the same relation one to another as the Old

English and the modern or standard Game. The Bruges is a tall, coarse-looking fowl with pea-comb, heavy brow, comparatively scant plumage and small tail, usually some kind of a blue in colour, either blue-red or blue-gray. Hens, blue with lacing, similar to Andalusians. Being part Malay in blood, it is not a real Game bird, and consequently of no value for pit purposes. In this connection there is cause to remark that if any cross be made between Game and non-Game, the offspring may be line-bred to the Game parent for countless generations and will never produce a genuine Game-fowl.

French

The *Combattant du Nord* is practically identical with the *Flamand* of southern Belgium, the two being often bred together or crossed one upon the other. Yet some few minor differences may be noticed. The French fowl averages about half a pound lighter in weight than the Flemish and shows some feather markings not often seen in that variety. Fully one-half of the French birds are yellow-legged, black-breasted, bright reds, the remainder being blue-legged dark reds, green-legged golden duckwings, yellow-legged pyles, and yellow-legged pure whites. Fowls with white legs are occasionally seen, but rare. The two adjoining departments of Nord and Pas-de-Calais are a kind of cock-fighters' paradise.

Game is the common fowl of the country, and in nearly all the larger towns and cities cocking contests are advertised on the bill-boards and mains fought every day in the week between St. Eloi and 1st of May. Roubaix has the largest cockpit in Europe, with a seating capacity of two thousand. It is here most of the grand concourses take place. At Lille there are more than twenty public cockpits, besides a fine big hippodrome where entertainments of this sort are sometimes held. The best birds of Britain have there fought and lost.

Another cocking community exists at St. Malo, Ille-et-Vilaine, and extending into Brittany. Here the birds are mostly medium weights, fought with rules and steels not unlike the American. One other cocking center is in Ariége, near the Spanish frontier, and the sport is not unknown at Marseilles. From all that can be learned, it would seem as if Game-fowl had been bred in France since before the time of Cæsar's invasion. They are known to have existed in Britain at that early date, and it certainly appears more reasonable to suppose the birds were taken across

the channel from the Gauls of the mainland, who held many customs and practices in common with their island neighbors, rather than imagine the birds carried over sea all the way from the Levant by the tin-hunting Phœnicians and then dropped among the semisavage nomads on the wild and dreary coast of Cornwall. Prior to about the year 1830, when it was put under ban, cocking was a popular pastime at the French capital. Since then the gay Parisians "know not Joseph," but get their excitement through such channels as the naughty can-can and the "*danse du ventre*."

By courtesy of Dr. Clarke

AFTER HIS SIXTH BATTLE

Showing the American method of heeling and trimming

Two foreign breeds found in France may well be considered under this heading. One is the "*Race de Barbarie*," or fighting Bantam, and the other a naked-neck fowl called "*Malgache*" or "*Denude*" from Madagascar. The name Barbary was once applied to the five states of northern Africa: Egypt, Tripoli, Tunis, Algeria, and Morocco, all then under the suzerainty of the Sultan of Turkey, and the presumption is that these Bantams came originally from one of those countries, just which one is not now known. Of late years no Game-fowls have been discovered in northern Africa except a few among the Spanish settlements at Ceuta, Melilla, etc. The Barbary cocks of France usually weigh from two to two and a half

pounds, greatly resemble in style the newly produced Old English Game Bantam (some strains of the latter being unquestionably of Barbary blood), and run through the usual variation in colors. The handsomest are *mille-fleurs*, what we might call tri-color spangles. They are fought in funny little steel spurs about one inch in length, can fly almost equal to pigeons, and the pure breed is said to be absolutely game.

The *Malgache* is much like a Shamo Jap whose plumage has been all plucked out excepting wings, tail and a small tuft on top of the head. Too slow for any use excepting naked-heels—and fowls are not fought that way in France—but of very greatest interest to the scientific breeder and naturalist. All Oriental Game-fowls are scant in plumage and often show spots of bare red skin upon breast and shoulders, so it is easy to see how this tendency could be followed up, by selection in breeding, until a bird were produced almost destitute of feathers. But think where this chicken, as illustrated on page 423, comes from—that is the most remarkable thing—from the Island of Madagascar. The dominant native tribe there is the Hova, whose language as well as racial characteristics show a relationship not with the nearby coast of Africa, but with the Malay country, more than three thousand miles away.

Think how remarkable that such a man should have been able to cross the Indian Ocean centuries ago, even before its waters were ruffled by European craft. Think how much more wonderful still the fact that he took his domestic fowls with him, that the Oriental type remained unchanged in its new-found home—not all varieties are lacking in plumage—and that real Malay chickens may be had to-day as easily in Madagascar, Reunion, and Mauritius (see Mr. Weir's remarks on Ravenhill's Malays) as at Pinang or Singapore.

Spanish

The Spaniards as well as their descendants are notoriously poor breeders, so it would not be surprising if the fowls of Spain were very frequently infused with a bracer of English blood, just as the strains of Mexico are kept up by importations from this country. But that Game-birds and cocking were unknown in the Peninsula before the campaigns of Wellington and his soldiers—a view almost universally held in Great Britain—seems very difficult to reconcile with the well-known fact that Spanish Game, "*Gallos de pelea Espanoles*," have been fought in Cuba

ever since the island's first settlement. Spain is one country in the world where the royal sport is undoubtedly on the decline. There is no longer a pit at Cadiz—formerly one of the great cocking centers—and very few birds are now to be seen at Algeciras, Marbella, Cartagena or Valencia. Malaga still has a fair supply and seems to be about the only city on the Mediterranean so provided.

Of the different lands where cocking flourished in early historic times—Italy, Greece, Asia Minor, the Island of Rhodes, Egypt, Persia—not one contains a native race of Game at present, and the sport survives only in the last-named country in the form of small boys' amusement, matching common cocks in nature's weapons.

Photograph taken 1901 and reproduced by courtesy of Dr. Clark

ISLAND OF MADAGASCAR GAME

OLD KENT AND SUSSEX BARN-DOOR COCK

THE FARM OR HOMESTEAD FOWL*

"Let me embrace thee, good old chronicle,
That hast so long walk'd hand in hand with time."—TROILUS AND CRESSIDA.

THE time and origin of our domestic fowl will never be known; surmises have been made, and indefinite conclusions have been arrived at, but the foundations of belief are such as to leave considerable doubt as to the stability and strength of the theory, though said to be based on natural sequences. Whether the domestic fowl was derived from one source only, or whether there were others that have passed from the earth leaving no trace behind, is a moot question, and one that must

* As the three following chapters deal largely with English breeds, Mr. Weir's text as it appeared in the English edition has been but slightly changed. It is printed substantially as he wrote it, except where condensation and revision were necessary to meet American ideas and conditions.—EDITOR.

be left undecided. No absolute proof exists, yet there are peculiarities and differences that were noted centuries ago, that I for one can scarcely reconcile, as to our domestic fowl having but one common origin, that of *Gallus bankiva*. It being so well known, it is needless to say that thousands of years ago poultry was not only one of the valued adjuncts of the farm, but, from descriptions of them still in existence, there were other numerous forms, sizes, and varieties; though as to what they were, or how differing from each other, we get no insight until about the first year of the Christian era, and that from the pens of Lucius Junius, Moderratus, Columella, Varro, and Pliny the younger. Nor do any of these write as though the varieties were something new, or that the fowls of the period were merely the reclaimed of the wild, but distinctly point to the fact by their descriptions that there was at that time little or no resemblance between the varieties then enumerated and the slightly made, brilliant-colored inhabitants of the Indian jungle. True, they write of the courageous fowls of Tanagra, and they note also the fatting of a different kind of poultry at Delos, etc.; while Columella gives at length a description which, taken as being correct, tells of a fowl for the homestead and for the table of even superexcellence. Nor are these mentioned as in any way peculiar or strange; but such, among others, in the belief of the writer, being the best of their kind and the most desirable for profit beyond all others. Thus at that time the fowl as a household bird was plentiful, of the highest quality, and not only in great variety, but even then held in the greatest esteem, as much for its dignified bearing and courage as for its culinary usefulness.

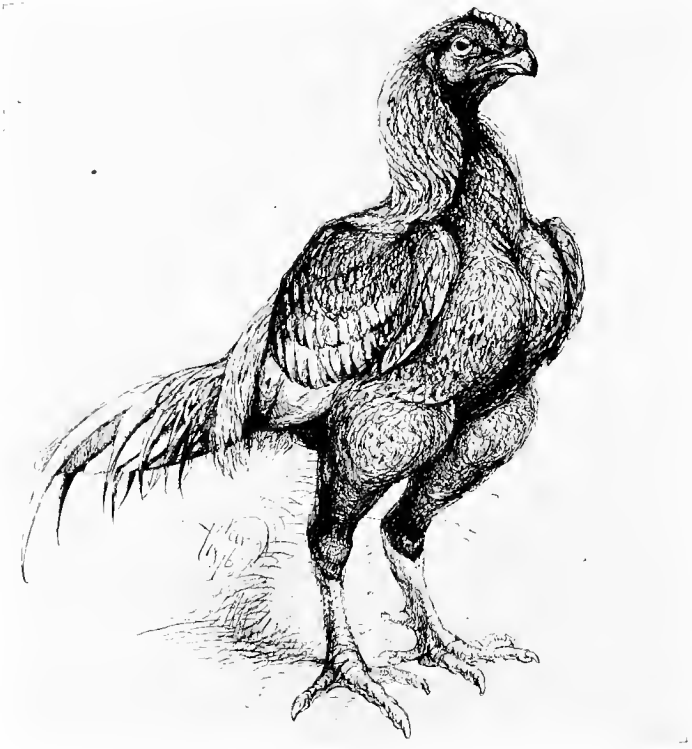
Pliny the younger, having a naturalist's knowledge of the fowl as it then was, writes enthusiastically of the noble bird. In the tenth book of his great work he says: "These birds about our houses are our sentinels by night. Nature has created them to awaken and call men up to do their work; they have also a sense and understanding of glory; moreover, they are astronomers and know the course of the stars; they divide the day by their crowing from three hours to three hours; when the sun goes to rest they go to roost, and like sentinels they keep relief of the fourth watch; in the camp they call men up to their careful labor and travel. They will not suffer the sun to rise and steal upon us, but they give warning of it; by their crowing they tell us the day is coming, likewise by clapping their sides with their wings. Ye shall see them march stately, carrying

their necks bolt upright, with a comb on their heads like the crest of a soldier's helmet, and there is not a bird besides himself that so oft looketh up to the sun and sky; and hereupon it is that, advancing proudly as they do, the very lions, which of all wild beasts are the most courageous, will not abide the sight of them."

This is the general outline of "the bird" as Pliny saw it, and for which he has no stint of admiration. But long before his time —ages, perhaps—its valor was known, and in the far-away centuries it was appreciated; and one section at least was kept almost as warrior retainers for strife and "wage of battle" only. Of these, distinctive as birds of a higher grade, different as is the mettled racer or the Arab steed from the massive Clydesdale cart-horse, was the Game-fowl of Tanagra from that of the farm, so well described by Columella as the fowl that lacked nothing to make it perfect in form, size, and utility; he also tells what it should be and no doubt then was: "They should be of a plumage red or tawny, with black wings.

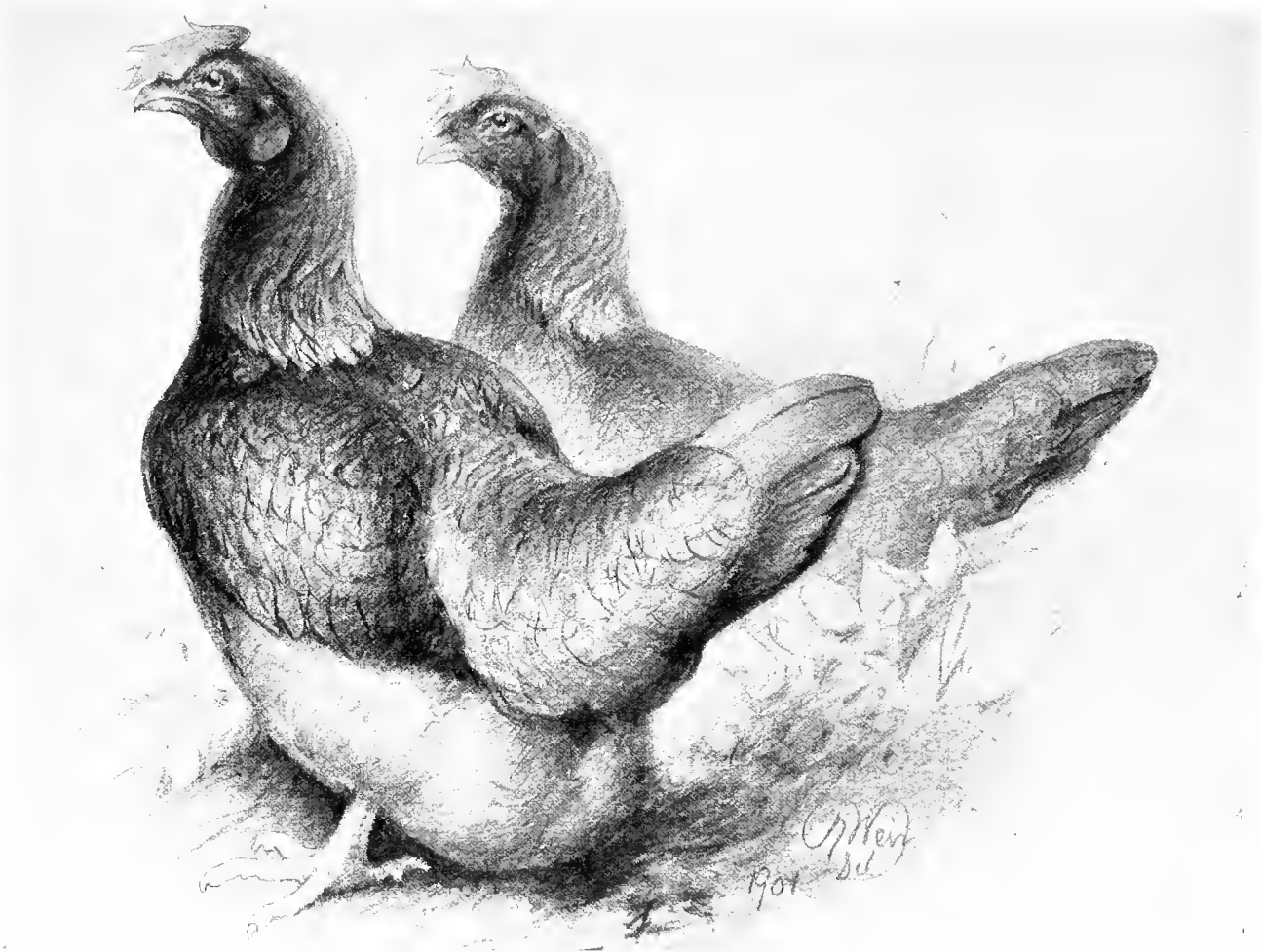
CORNISH INDIAN PULLET, SHOWING PHEASANT MARKINGS
First prize, Crystal Palace, 1893

Let the whole be of the same color, or a near approach. Let white fowls be avoided, for they are tender and less robust; neither is it easy to find those of that color that are prolific. Let the breeding hens be of a choice color, of robust body, square-framed, large and broad-breasted, large heads, with small erect combs and white ears; and of those thus characterized let the largest be procured, and not with an equal number of claws. Those hens are reckoned the purest bred which are five-clawed, but so placed that no cross spurs arise from the legs, for she that hath this malelike appendage is rarely fruitful, and when she does sit she breaks the eggs with her sharp spurs or claws."



OLD AZEEL COCK
Owned by Mr. Weir

Here it will be observed that as far back as two thousand years Columella speaks of the pureness of breed; this is evidence that there were others with which they might be mingled or crossed, but he does not consider it advisable, as he expressly mentions that the hens should be of the "purest breed"; and if the hens were of such form and color it would be difficult to either improve or equal, much less surpass them, just in the same way and for the same reason that the Kent, Sussex, and Surrey fowls of fifty years ago were pronounced by



OLD KENT FARM FOWLS

competent judges to be of such excellence for the table as was "unsurpassed and unsurpassable."

Columella continues: "The cocks should be lustful, colored like the hens, with the same number of claws, but taller, proud of carriage, with combs erect, and of blood-red; eyes brown and black, beak short and hooked, ears very large and very white, wattles looking white for their shining and hanging down like a beard; the feathers of the neck varying, but preferably yellow or golden, and spreading down over the shoulders; the breast broad and muscular, the wings brawny, like arms; the tail lofty and composed of a double row of arching feathers, legs sturdy, not long, but armed as it were with dangerous spurs. Even when not prepared for fighting or triumph of victory their temper should be shown to be highly generous, haughty, active, watchful, and given to crow often, also not easily alarmed, for sometimes it may be needful for them to repel attacks and protect their conjugal flocks."

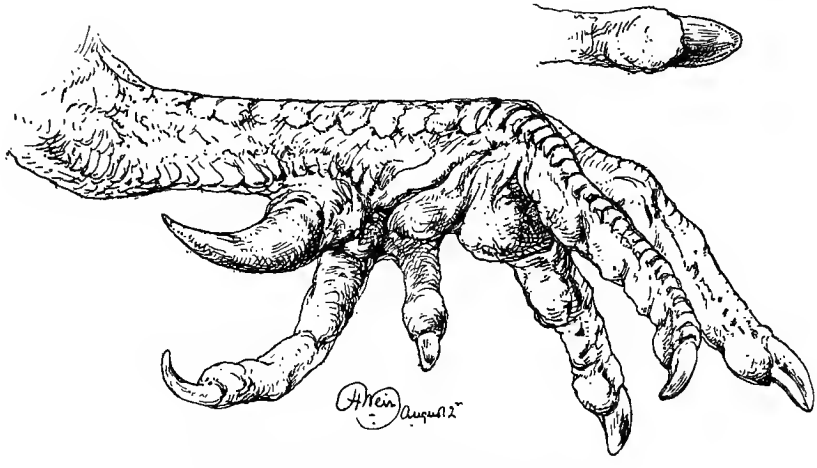
From the foregoing may be noted the great resemblance between these and our old Kent, Sussex, and Surrey five-toed fowls of half a century ago. Chaucer, writing in the fourteenth century, tells of a similar fowl.

Maister Prudens Choiselat (in 1586) describes the farm fowl of that period, and the profit to be gained by a poultry farm to be "five hundred pounds of honest profit, all cost and charges deducted." He states that "fivescore cocks shall suffice for twelve hundred hennes; for one cock may suffice for ten hennes." And as for their age, those of "one yeare and a half unto two yeares are the best."* The color is like to that described by Columella: "You shall consider the plumage or feathers; the black, red, and tawnie are the best, also they have their crests or combs upright and double, or divided; their eyes red and glistening, their beaks short and hooked, well spurred, their going haughtie and proude, their voice strong and sounding, and a crow much representyng such a majestie as the cock of the Persians, which among them was reverenced for a 'Kyng,' as reciteth Aristophanes."

It appears that in those days women were employed "to increase and govern them well": "You must have foure servants or maides with large eares, well to conceive and understand your commandments, and the feete of hartes, with diligent expedition to execute the same, and a right trustie right hande to be faithful, loiall, obedient, and of few

*Then as now.

wordes; for, as saith Terentian Parmenis, 'it is a great fault of servants to be babblers and not to keep their master's counsel'; their office shall be bringing the hennes into their houses every day at five of the clock in



LEG OF TAWNY OLD KENT FIVE-TOED FOWL
Bred and owned by Mr. Weir

the evening in summer, and at three of the clock in winter; also they shall be diligent to close the entries and windows of the henne-houses, that in the nighte the foxe* (the natural enemy of the henne), weaselles, and polecats, mai have no access, and in the morning open the entries and windows that they may come forth, and then make clean the perches and lathes; also refresh their pottes and troughs with clean water, for filthy and corrupt water engendereth pippe and other sicknesses."

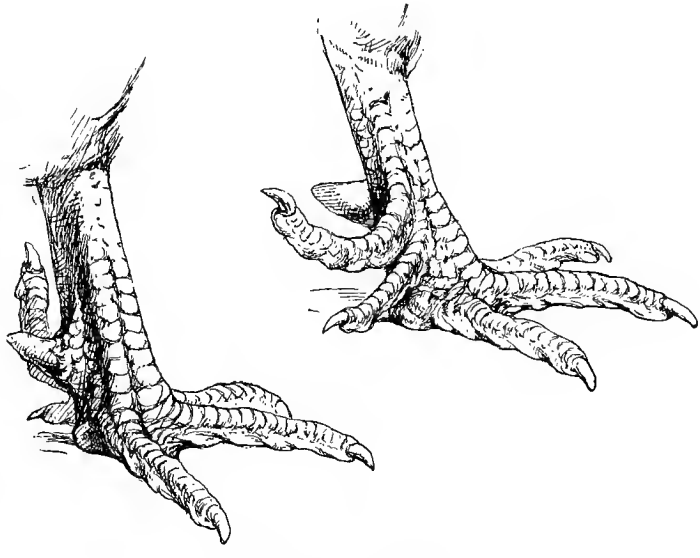
Here it should be noted that the hen-house is to be cleansed every morning, and further, that fresh water is to be given in all the pots and troughs; showing how careful the poultry-keeper of that period was for the comfort, health, and cleanliness of his fowls. But I am somewhat in doubt whether it would be possible to get "four maides with large eares" to undertake the management of twelve hundred hens and five-score cocks at the present time.

All the writers on the subject seem to agree with Columella as to what a good fowl should be. Leonard Mascall, writing in 1581, speaks

* It will be observed that both in this century and the subsequent no mention is made of the *rat*, which is now the bane of nearly all our poultry yards and houses.

precisely in the same way as to the signs and figure of a good hen: "And these to be of a tawny color, or of a russet [reddish black], which are counted the chiefest colors; and those hennes next whiche hathe ye pens * and hackled not all blackish but in parte, as in the greye and white hennes, are nothynge so profitable. The henne with a tuft of feathers on her head is reasonably good, and of feathered hens also keep the grey, the brown, and the red." This is the first mention of top-knots. He adds: "Chickens lay in seven months." † Our present early layers lay sometimes at five months, but this is an exception; so in this respect we have now a slight advantage with some breeds, but not in all. Further he says: "The redde cocke is counted on as the best."

Thomas Cogan, Maister of Artes, in "The Haven of Health" (1595) points to the fact that "the fleshe of those fowles which trust most to their winges and to breed in high countries is lighter than the fleshe of such as seldom or never flies and be bred at home."



FEET OF OLD KENT FOWL
Once owned by Mr. Weir

This is a truism that is not sufficiently recognized now. Any one keeping fowls for the table must be aware that unless they have their liberty and freedom to fly, and so exercise their wings, it is useless to expect to find a large muscular system, such as the pectoral, as when the wings are used freely and often. With poultry kept only for the production of eggs it

* The primary wing feathers.

† Several of my old gray-colored Kent and Sussex have laid this year (1902) before they were six months old.

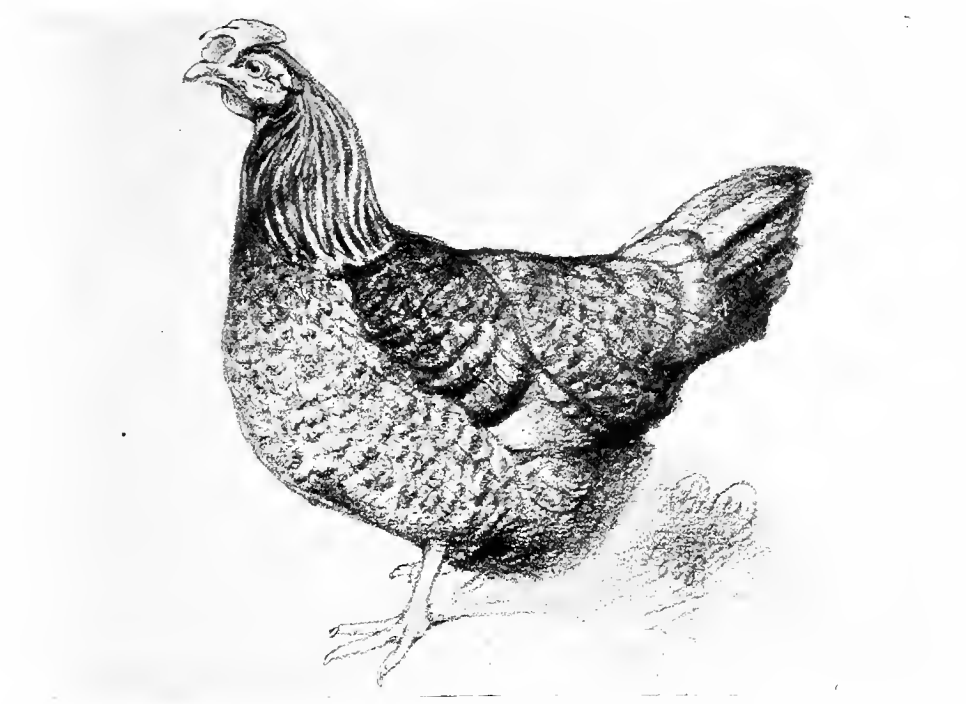
matters little, as fleshy muscular development is not needed, nor is it generally in such existence when the hens are prolific egg-producers.

In the translation from the French by Surflet of "The Maison Rustique," 1600, occurs the following: "As concerning and ordering of pullen, which is the cheapest thing that a good housewife is to regard, there must care be had that the hen-house be every day made clean, even so soon as the pullen be out, and the dung put aside for fatting the meadows." Again, cleanliness in the hen-house is considered to be one of the chief points tending to success, and the frequent destroying of insects most essential, nor is it nearly often enough put into practice by the modern henwife or poultryman; but, says the old writer: "It is always preferable to have baskets for your hennes to lay in, inasmuch as you can take the baskets, and by having a large lead tank or cistern, put them into any liquid you may like to destroy the insects, then dry, and put them back again in their proper positions. You will find this a very excellent plan."

And again the importance of fresh, clean, clear water is urged on the housewife, not simply as a want, but as an actual necessity, and as not only one, but as the most prominent means of keeping the poultry flock healthy. "Their water-pots to let them drink must be kept clean, and filled with clean water every day, and that twice in winter and thrice in summer. Let their water be good alwaies." The extreme wisdom of following this advice must be manifest to the most careless, for it is well known that the germs of typhoid fever, which are so fatal to the human species, are generally present in dirty or sewage water. "Let her [that is, the housewife] cause to be cast out upon the dunghill oftentimes fresh straw, right over against the barne, where the pullen used to scratch, and neare unto the same place let her cause to be put sand, dust, or ashes, to procure them the pleasure of dusting themselves in the sunne and preening their feathers." This is quoted to show that all these things were as carefully attended and looked to over three hundred years ago as now, and it might be added generally more so. Nearly all our modern methods are only the old ones re-substituted, even that of the incubator. In the olden time they kept fowls and bred chickens with a greater certainty and in better health than many of the now professed poultrymen of the day.

And still further, writing of the dunghill cock (1630), Gervase Markham says: "You shall understand that the dunghill cock (for the fighting

cock deserveth much larger and particular discourse) is a fowl above all other birds, the most manlyest, stately, and majesticall, very tame and familiar with man, and naturally inclined to live and prosper in hospitable houses."* This was in Markham's time possibly the case, or at least before that, because the kitchen was not infrequently a roosting-place for the poultry. Chaucer mentions this in the "Nun's Tale," as regards Chanticlere. But further, Markham describes the cock as "hot and



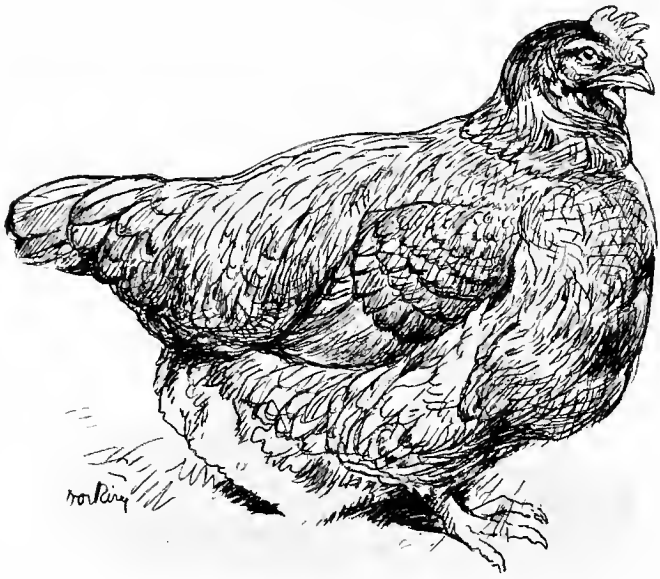
DARK OLD KENT AND SUSSEX FOUR-TOED PULLET

strong for generation, and will serve ten hens sufficiently, and some twelve and thirteen; he delighteth in open and liberal plains, where he may lead forth his hens into green pastures and under hedges, where they warm and bathe themselves in the sun, for to be penned up in walled places or in paved courts is most unnatural to them, neither will they prosper therein."

"Now for the hen," says Gervase Markham, "if she be good, she

*May not this have reference to "household pieces," which too often are plentiful when provisions are abundant?

should not differ much from the nature of the cock, but be valiant, and laborious, both for herself and her chickens." (This is self-evident, and should be an almost indispensable quality in every barn-door hen.) "Her shape—the biggest and largest are the best, every proportion answering those described of the cock, only instead of her comb she should have upon her crown a high, thick tuft of feathers; to have many strong claws is good, but to want their hinder claws is better, for they oft break their eggs, and such hens sometimes prove unnatural." (Perhaps he means by this that the spurred hens crow, which is not infrequently the case, but nevertheless they lay well and are excellent mothers.) He continues, however, "It is not good to choose a crowing hen."



From a drawing by Harrison Weir

OLD-STYLE KENT FIVE-TOED HEN

Old Barn-door Fowls

Having traced the red, tawny, black, and gray fowl through the Middle Ages in reference to color, form, and usefulness, it will be well to show its importance as part of the live stock of the farm, and as the luxurious food of the lord, the landowner, or the wealthy. As stated before, there can be but little doubt, if any, that the Romans bred both Game- or fighting-cocks, as well as the magnificent domestic fowl which have been so carefully and minutely described by Columella and Pliny. Each author quoted gives the outline of form and color of the particular and much-to-be-desired breed of his time as the best, in terms almost

identical with the Game-cock. Though possibly not proved, still it is rightly supposed that the Romans, when in England, had this very breed about their farms and villas, while it is a most curious fact that only the bones of the Game- or fighting-cock have been discovered. Later, the Anglo-Saxons must have kept them, as the bondmen, "borderius," or small farmers had the care of the poultry to supply the table or "board" of their lord and master, and their farms they held as bordlands, from whence they furnished eggs, poultry, and other cibarious produce. Rent was likewise paid either in service or land-produce, as was also the case in A.D. 1066. It was, however, found far easier to collect the manorial dues once for all in coin than to ensure the various services of work, and boon work, and the payments of seed, fowls, geese, or eggs—though they were faithfully rendered. Of such importance were fowls as articles of food and commerce that from very early times they are to be found included as part of the fines and rent-charge of lands and tenements, numerous documents being still in existence attesting the fact. As notes from some of these may prove interesting, I will give some extracts from the "Kent Archæological Society's Transactions" (though there are entries of fines elsewhere of a much earlier date), giving simply the number under which they are tabulated, and omitting details foreign to my purpose:

VOL. XIII. 8TH OF KING EDWARD II.

(384) £1 11*s.* 6*d.* rent, and rent of 10 cocks and 30 hens and appurtenances.

(421) £4 7*s.* 4*d.* rent, and rent of one ploughshare, 7 cocks, 48 hens, 2 geese, and 392 eggs and appurtenances.

(438) 3*s.* rent, and rent of 5 hens and pasturage for 15 two-year-old sheep.

(445) The fourth part of 57*s.* 10¾*d.* rent, and rent of a fourth part of 19½ hens and 190 eggs.

VOL. XV. 17TH OF KING EDWARD II.

(753) At Westminster. 1 messuage of 250 acres, 10 acres of wood, 21*s.* rent, and rent of 17 hens with appurtenances.

(761) £4 rent, and rent of 4 cocks, 100 hens, and 100 eggs.

(771) Sixth part of 3*s.* 8*d.* rent, and rent of 1 cock and 3 hens with appurtenances.

(805) 34*s.* rent, and rent of 20 hens, etc.

(806) 3*s.* rent, and rent of 4 hens and 36 eggs, etc.

(892) 20*s.* rent, and rent of 2 cocks and 10 hens with appurtenances.

(894) 100*s.* rent, and rent of 21 hens and 200 eggs, etc.

These are a few covenants out of many, and are only given to show that there must have been a certain evenness of quality, size, and value in poultry throughout this period, so as to be a recognized staple for barter, purchase, or rental. Some of these entries are quaint, such as that relating to a fourth part of 19½ hens, rendering the division somewhat difficult in the way of dividing the half a hen into four parts. Other entries are even still more interesting, for Hume, in his "History of England" (which is reproduced in the "Tunbridge Wells Guide" of 1701), states that "the Lady of a former Lord of Abergavenny offered the King a bribe of two hundred hens if she might be allowed to be with her

KENT BARN-DOOR SPURRED HEN

husband but a short time, who it is presumed was confined or imprisoned for some reason."

The tithes of Yaldham, Kent, from 140 acres of land were given by Godfried de Cos to the monks of St. Andrew, Rochester, and continued in the possession of the priory until its dissolution. They were afterward presented to the dean and chapter, who let them for twenty-one years for 6*s.* 8*d.* and two fat capons.

Again, in the twelfth year of the reign of Henry VIII. (De Banco Roll, Michaelmas term): To wit, Henry Ffynche [now spelled Finch] in his proper person demands against Thomas Grovehurst and Joan his wife, the Manor of Ore, Gondhurst,* and Hadlow, with appurtenances, also 300 acres of land, 40 acres of meadow, 200 acres of pasture, 40 acres of wood, 300 acres of marsh, and 40*s.* rent; also rent of 5 cocks, 20 hens, and 200 eggs, etc., etc.—"Kent Archæological Society's Transactions," Vol. XIII., page 330.

This is given *in extenso* to show the curious distinction made between land, meadow, and pasture. One more illustration of the strange way the farmers paid their rents at the beginning of the last century is from *Chambers's Journal*, September 4, 1897.

Abstract of rental of the real estate of James, late Earl Panmure:

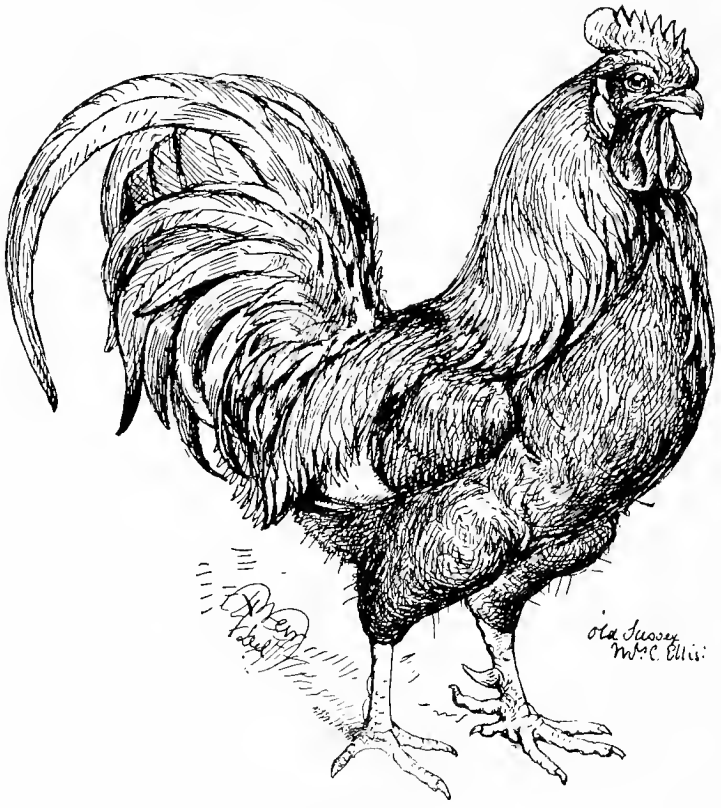
	£	*s.*	*d.*
Money rent payable in money	1,843	17	11½
Then follows botts of wheat, barley, oatmeal, etc	1,586	1	8½
Geese, 8, at 1*s.* each		8	0
Capons, 458, at 6*d.* each	11	9	0
Chickens, 456, at 1½*d.* each	2	17	0
Hens, 312½, at 3*d.* each	3	18	1½
etc., etc.			

Here again we get half a hen rendered and valued. How could this have been accomplished? It must have been a difficult task to dispose of such stock to advantage. Yet the method of payment partly in kind still existed in the nineteenth century, and does so in a few cases at the present time. However, these excerpts show our poultry was by no means a neglected farm product during the Middle Ages, but was carefully selected, tended, and used as being of a certain monetary value or exchange.

In a "Treatise on Husbandry," written by Maystre Groshede (Greathead or Grossteste), sometime Bishop of Lyncoln, entitled "Reules Sayns Robert," made and translated out of the French into English, and con-

* Now Goudhurst.

sisting of twenty-eight practical maxims—compiled by the learned bishop for the guidance of Margaret, Countess of Lincoln, who was left a widow A.D. 1240—it appears that instructions were to be given to the farm bailiff. From the wording it is conclusive as to the yield and profit that were expected from well-selected poultry, which were to be rented: "Fyve hennes and a cocke for IIIs. in a yere, and there be some baylyfs and deyes* that may say nay to thys prouffytes. But I shall preue it by reason, for in halfe a yere be XXVI weeks, and in those XXVI weeks IX score dayes, and in eche of these dayes shall have an egge of eche henne in that half yere, it is a feble sale, and XXX eggs be not worth a penny." As before remarked, the fowls kept for many centuries, and described by writers on the subject, were apparently unequaled in form, flesh, and large full breast by any cross-breeds of this half of the present century. Yet we have had these same old English farm or dunghill fowls described



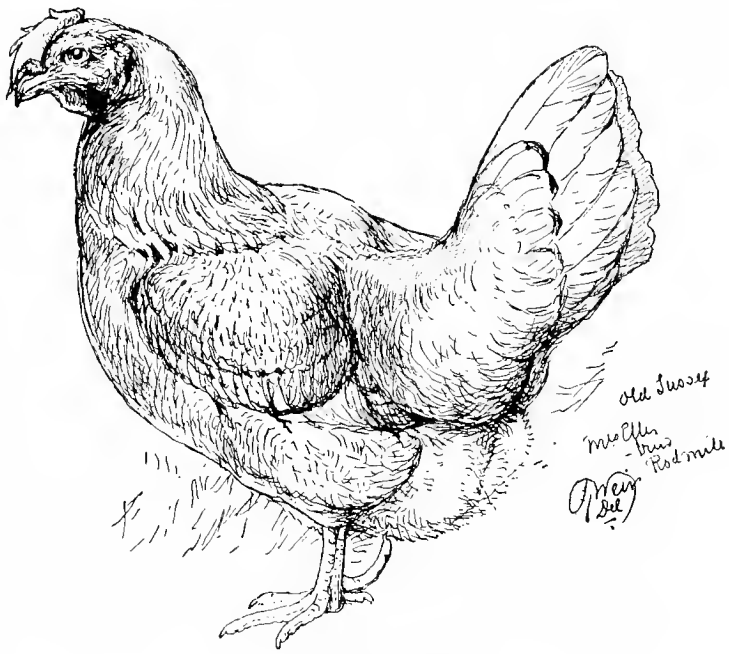
OLD SUSSEX COCK
Owned by Mrs. Ellis

*A female servant that had charge of the dairy and all pertaining to it, in some cases a man seeing to the same work.

as delicate, bad layers, and unfertile; but here is Bishop Groshead telling of the poultry of A.D. 1253, that besides these excellences of size, form, and colors they were also good layers—180 from a good table-fowl in half a year is a number that most of our modern hens fail to produce.

Nor does it appear that they were much inclined for incubation, for the Bishop puts in by way of parenthesis: "And yf ony of theym syt in that half a yere or in some daye in defaulte of lyenge, ye shall be recompensed therefor, and of VI more to bere out the ferme ye cocks and wt the sale of chikens yt syttynge hennes brynge forthe in that other half yere." Evidently from this the first half-year's eggs were by no means all that were laid, and if not, these "old-time hennes" are not equaled by our modern mongrels in any respect. He concludes: "Every henne shall answere you of IX score egges or of chikens to ye value."

As regards the prices of poultry in A.D 1261, capons were $2\frac{1}{2}d.$, cocks $\frac{1}{2}d.$, hens $1\frac{1}{2}d.$ In A.D. 1326 they rose to—capons $3d.$, cocks $1\frac{3}{4}d.$, pullets $1d.$; and in the time of the famine, A.D. 1368–70—capons $4d.$, cocks $2\frac{1}{2}d.$, hens $2d.$, pullets $1\frac{1}{2}d.$ These prices ruled with only a little deflection until A.D. 1400–20, when food again becoming scarce they rose; and Kentish capons are frequently quoted at a higher price than the ordinary capons, in some cases being of double the value. No mention is anywhere made of Sussex as being



OLD SUSSEX HEN
Owned by Mrs. Ellis

good, nor is "Dorking" accredited with fowls of any particular merit—in fact, with none at all.

Perhaps it would be well to give an idea of the general state of agriculture and farm produce of England over three centuries ago. Here are some passages of a book entitled "A Compendious or Brief Examination of certayne Ordinary Complaints of divers our Countrymen in these our Dayes." It was written by W. S. (William Stafford), gentleman, and was for a time erroneously ascribed to Shakespeare. It bears the date of 1581, and treats in dialogue of the depressed state of the country at that period, and of the great dearth then existing, and its supposed causes. Here is the gentleman's (a knight) complaint against the husbandman, in which we get the value of farm stock at this period:

"And I say it is long of you husbandmen, that wee are forced to rayse our rents by reason wee must buy so deere all things that wee have of you: as corne, cattell, goose, pig, capon, chicken, butter, and egges. What thing is there of all these but that yee sell it now deerer by the one half than yee did within these XXX yeares? I could in this towne [London] buy the best pig, or goose, that I could lay my hand on, for fourepence, which now costeth twelvepence, a good capon for threepence or fourpence, a chicken for i*d.* [one penny], a hen for ii*d.* [twopence], which costeth me double and triple y^e^ money; it is likewise in greater ware, as biefe and mutton." The husbandman answers: "I graunt that, but I say you and your sorte, men of lande, are the first cause hereof by reason you rayse your landes." The knight offers to lower the rent if the other will reduce the price of the food, which the latter ultimately refuses.

Further on it is interesting to note the profit the husbandman attributes to his live stock in comparison to his corn, for he answers: "And to say the very truth, I that have inclosed little or nothing of my grounde, could never be able to make up my lorde's rent were it not for a little herd that I have of neate,* sheepe, swyne, geese, and hennes, that I do rear on my ground; whereof, because the price is somewhat round, I make more clear profit than I doe of all my corne." Thus it will be seen that even over three hundred years ago corn-growing was not looked on with more favor by the farmers than at the present, though they grew, besides their cattle, poultry to advantage, as doubtless may yet be done.

Presently the Doctor (scholar and parson) speaks, and after enumer-

* Cattle.

ating the value of various goods says: "Then the more husbandry there is occupied, the more universal breede should be of all victuals of meate, sheepe, swine, geese, hennes, capons, and chickens; for all these are reared much on corne." It appears, then, that the argument for the breeding and rearing of poultry would be equally applicable at the present time; and it is my firm belief that this particular live stock of the farm was then more even and finer in quality than those of the ordinary farmer of to-day; which if more understood, as a high-class food production, better prices would be realized, consequently a larger degree of profit. As to the value of poultry, and the quantity provided at the numerous feasts of the middle and later ages, it will be best to follow up the fine old English breeds of fowls gradually with regard to their marks, value, and locality.

Horsham was a parliamentary borough from the year 1295, and a market-town. In 1697 (more than two hundred years ago) "The Traveller's Almanack" mentions the market as being held on Saturday; and in 1770 a gazetteer describes it as having been granted by King John, and having great store of poultry, usually bought up for the London market. The Horsham poultry market in 1837 was held on Mondays at "The Black Horse," where a considerable number of poultry changed hands.

"Kent was celebrated for its capons centuries ago, and in a lesser degree Sussex. Dorking became known as a fatting center about the middle of the eighteenth century, the fowls for which it afterward became so celebrated mostly coming from Kent and Sussex, and it, like these also, may have derived the white breed for which the district became noted from the Romans.* The great causeway called Stoney Street passes through Dorking Churchyard. Dorking was destroyed by the Danes, but was rebuilt by Canute or the Normans. This place is famous for its meat trade and its market for poultry, particularly for the largest geese and the fattest capons, which are brought hither from Horsham in Sussex; and the whole business of the people, for many miles, consists in breeding and fattening; its market is on Thursdays."

An old friend of long ago, who lived at Dorking and well knew its history, once mentioned to me the fact that incredible numbers of fowls were sold in Dorking. Upon my questioning him as to what they were, etc., he said that mostly they were not bred at Dorking, but came from Sussex, and Horsham market in particular.

* *Vide* "Environs of London," A.D. 1761.

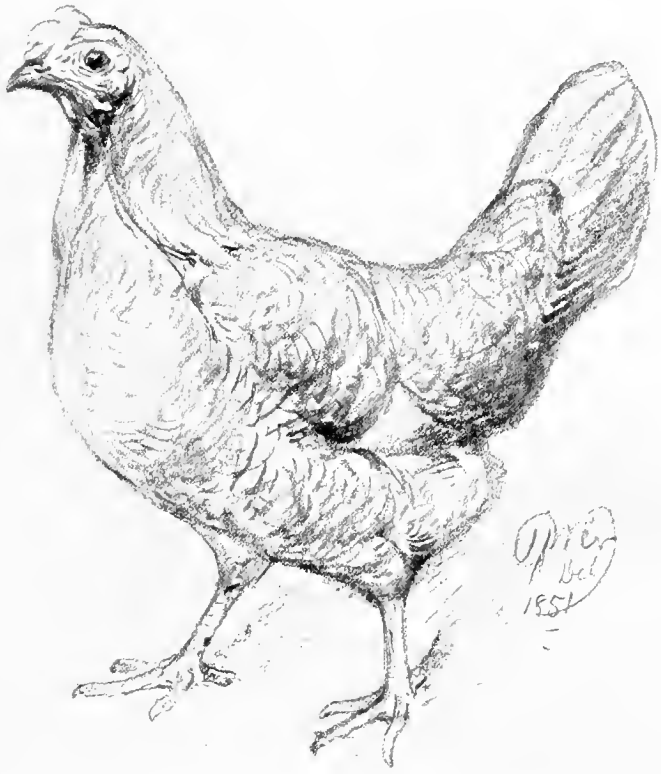
From this and what is to be gathered from various other reliable sources it is pretty certain that Dorking was only a fattening station like Uckfield, Waldron, Heathfield, Handcross, some places in Kent, and Boston in Lincolnshire; and the fowls coming from these might just as well, and with the same propriety, be called Heathfields, Waldrons, etc., or Bostons; they are so in the dead markets, but not as a distinctive breed. The Dorkings, as a breed, have got a reputation entirely from the slovenly writings of several authors, who have simply echoed the previous one without inquiry or verification, while the Kent fowls are historical. Of Kent, centuries ago, it was said: "The Weald for wood; East Kent for corn; Romney for meadow; Tenham for an orchard; Sheppey and Reculvers for wheat; Thanet for barley; and Headcorn for the brood of big, fat, and commended capons" ("British Curiosities in Art and Nature," 1728).

Mr. Ferguson, in his excellent book on fowls, 1854, gives the following item of interest: "That a breed bearing much resemblance to our Dorking, both for external appearance and internal qualities, as well as possessing the additional claw, has long been propagated in the town of Dorking is conclusive. I have before me a list of the fowls remitted to market by a farmer living there, from June to August, A.D. 1683, comprising:

17 dozen	.....	5	claws,	dead stock
1 "	.....	4	"	" "
1 "	.....	5	"	live stock"

From this we observe the five-clawed fowls were well known in that locality, and at that comparatively early date appear to have been more numerously kept than the four-clawed ones, at any rate by this individual.* I also discover from the original manuscript that the price for the one dozen five-clawed ones (alive) was nearly three times the amount of the dead stock. It was therefore at that time, as until lately has been the case, "the breeders were determined, if possible, to monopolize the trade." Here Mr. Ferguson does not seem to be aware, or has not taken into consideration, that all the southern fowls at least were more or less five-clawed, and thus described by Gervase Markham in the early part of the same century; so the argument of the five-clawed being a breed peculiar to Dorking utterly falls to the ground. The four-toed birds were most likely a cross between the old English Game and the ordinary barn-door,

* This confutes the oft-repeated statement that four-toed fowls were unknown in the real and old "Dorking" breed.



SUSSEX BARN-DOOR FOWL
Sixty years since

many white-shanked Game-cocks being "at walk" about the farms and homesteads of Kent, Sussex, and Surrey. The live fowls being sold for more than the dead is no criterion of price, the first possibly being matured and good breeding stock, while those dead were the refuse, and killed as being of no value alive. "Still," continues Mr. Ferguson, "it is evident that the town of Dorking and its suburbs are now, as heretofore, not only more suitable, from the nature of the soil, to the rearing and breeding of this class of fowl, but every other thrives unusually well there." In this there is the error that this breed of five-clawed fowl throve better at Dorking than elsewhere; for Kent produced better, and Sussex, as noted, reared large quantities, which, being taken to Horsham market, were

purchased to be fattened at Dorking and then sent away as the particular breed of the town; and when, as further proof, the breed was sought for to exhibit (*circa* 1850), the best southern birds came from Kent and Sussex, and in the north some from Lancashire and even Scotland. It is indeed surprising how long and persistently it has been the endeavor of some writers about our poultry to attach an undue, an undeserved and inaccurate importance to the town of Dorking in connection with fine and excellent white-shanked, five-toed, colored fowls, and those of Kent and Sussex, when, as has been shown, most of these were bought at Horsham. And further, history points to the fact that such fowls have for centuries always been plentiful in our southern counties, and not only used as food, but also as articles of barter and commerce.

WHITE-SHANKED AND SPANGLED PARTRIDGE GAME HEN

Style often used to cross with the old four toed and other barn-door fowls

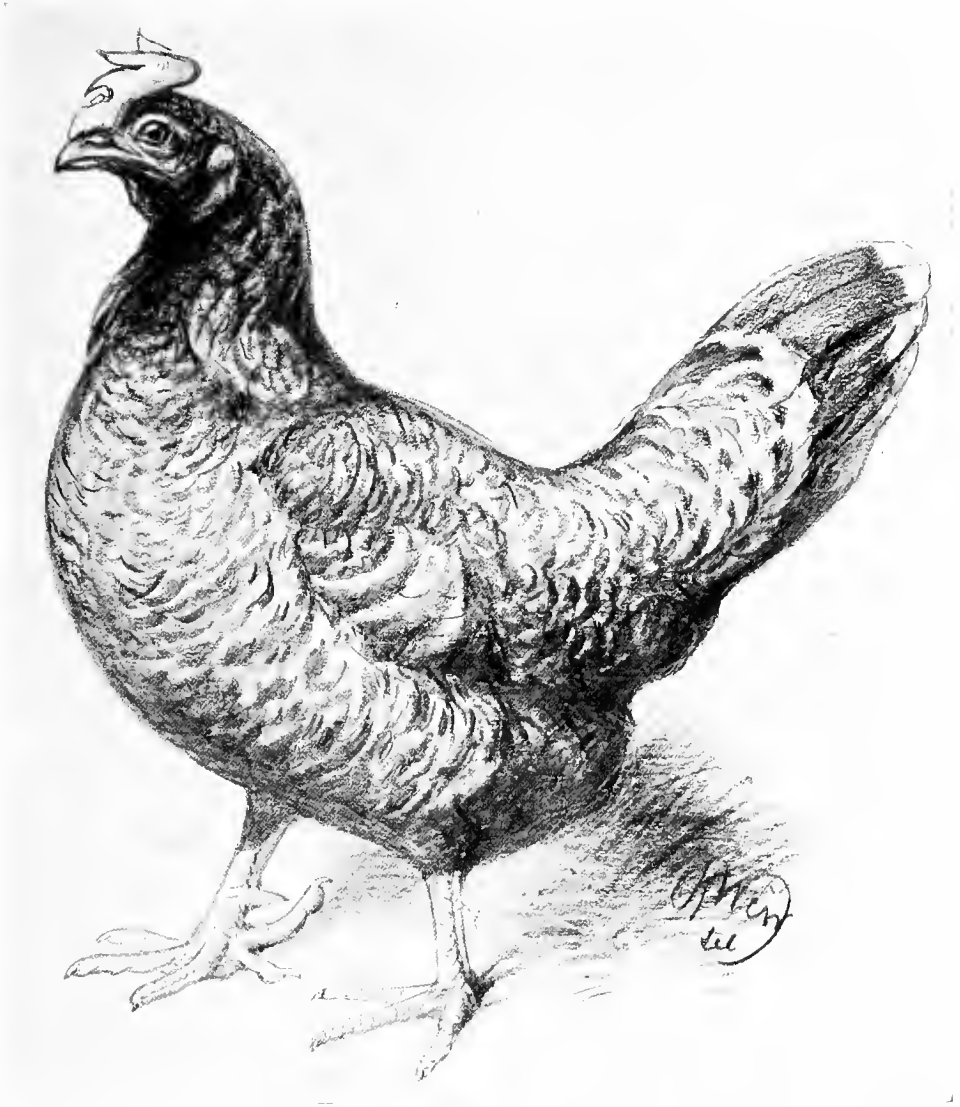
In Italy five-toed fowls have long existed; also in France, as several French writers affirm, and who are quoted; so in Norway, Sweden, and Spain; and yet with regret one sees it asserted that these, and more especially those in England, in some way owe their origin to the town of Dorking, the writers failing to see the absurdity of the theory. It is an entire misnomer and an utter fallacy to call our fine old Kent, Sussex, and Surrey fowls all Dorkings, nor were they thus called until about 1850, previously only the rose-combed whites being so considered. Even now so little is known concerning our poultry by those "in office" that not infrequently schedules are made out and prizes offered for Sussex and Surrey fowls with those of Kent omitted, which was one of if not the very best breeds, and quite equal to anything in the former counties. Such omissions, wilful or otherwise, lead to the strong suspicion that many of our best show-prize birds are the outcome of a combat of interests.

In the "General View of Agriculture in the County of Kent, 1805," Mr. John Boys writes of the Kent poultry thus: "Geese and turkeys, fowls and ducks, are bred in the county sufficiently to supply the inhabitants, and a few to spare for the supply of the shipping that sailed from Faversham and the Downs." He goes on to say that the price of poultry is very much increased within the last few years; turkeys now sell as high as 6*s*. and 7*s*., geese* 4*s*. to 5*s*. each, and ducks and fowls at 3*s*. 6*d*. to 4*s*. I believe I am correct in saying that this Mr. John Boys was an ancestor of the Reverend John Boys, who became, with his "old Kents," a prominent prize-winner in the early fifties of the last century. This brings the breed of the Kent, Sussex, Surrey, and Dorking fowls down to the institution of poultry shows, and to the time when such fowls, which have been carefully noted and described by numerous authors, were those so long cherished and kept in the southern counties. It will be my next duty to show what they then were, and how they at once not only took a high position, but were eagerly sought for on their merits as high-class fowls, being raised in Kent, Sussex, and Surrey by the farmers' wives and daughters from generation to generation; and many is the time I have heard wordy altercations as to the particular qualities and values of certain birds to be bred from or not. My own relatives had stocks of such good and true old Kent and also Sussex fowls as it would be almost impossible to find now; and there

* These then were small, seldom weighing more than nine to twelve pounds; the last being considered a very good goose even so late as about 1830–40.

was nothing on the different farms and homesteads that received and merited more attention. Some of the land, both in Sussex and Kent, having been family property for centuries, the poultry was as jealously guarded—almost as heirlooms. The colors at one farm were nearly white, with black in the hackles and tails; another flock was entirely cuckoo-colored; two kept to the old red and tawnies; three had mealy grays (these were very large) and one had light browns; all were very white in the shank and feet, with five toes and white toe-nails; the ear-lobes were large and nearly white, with a pink weather-tinge at the lower part. Until the importation of the Cochin there were no farm fowls with red ear-lobes as now—they were truer bred; a red ear-lobe shows decidedly a cross-breed. These were kept by farmers—friends of mine—who, one and all, were equally proud of their other stocks of poultry. One family in particular often boasted that they had kept the same breed over a century; they were dark reddish browns. Others kept black speckles; some red and some gray speckles, and mealy grays, with a variety nearly black. On the grass land about the house might be seen in early spring long lines of the old style of Sussex-made coops with the hens under them, and quantities of strong, healthy chickens running about or creeping in to nestle beneath the full-breasted, well-feathered, kindly mother hen; such were our Kent and Sussex farm fowls much more than sixty years ago as I knew them, saw them, fed them, and sketched them at our own home. Some of the breeds had been for centuries carefully mated and bred—not neglected, as has been erroneously and ignorantly stated; but to my own knowledge their shape, color, and qualities as table, egg-layers, and high-priced market fowls were well attended to, the owners being as proud of their poultry, and possibly more so, as nine-tenths of the prize-winners at the now fashionable poultry shows.

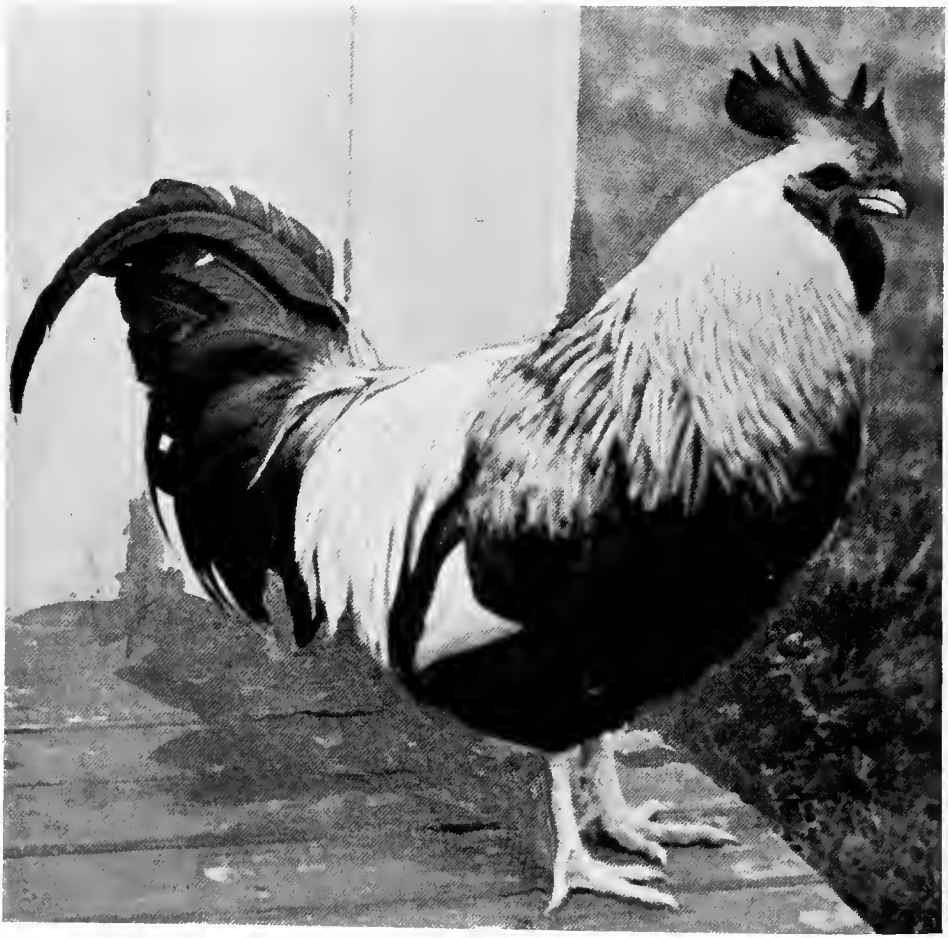
There were several reasons for this, of which nearly all the writers on the subject are obvious—namely, that in the corn-growing districts especially the "tail-wheat" siftings and winnowings were the perquisites of either the farm housewife or the daughters, and by them used for the keeping and rearing of poultry; for generally it was the proceeds from the sale of chickens, poultry, and eggs that they relied on as the source not only of pocket-money, but of actual clothing and other wants. These were by no means isolated cases, while not infrequently the general expenditure of the house was provided for entirely by the sale of dairy



WHITE-SPANGLED, BLACK-BREASTED, BRIGHT-RED OLD KENT AND SUSSEX FIVE-TOED HEN

produce and of the fowls. Thus it was that our southern farm poultry received such considerable attention and was so carefully bred. In some districts only certain colors were to be found, though all bore the same analogy to each other in point of form, being square, full-breasted, with good legs and thighs, large-winged and strong flyers, and were like to,

in almost every respect, those described by Columella nearly two thousand years ago; and this was not to be wondered at so much, for, if introduced by the Romans, the belief of Kent and Sussex men is that they were not crossed and spoiled with other and foreign varieties, as is the craze now to do. For this reason they bred their birds chiefly "in-and-in" or not out of their district, as they had not the means of either hearing of, seeing, or getting any other kinds but their old breeds, that had been kept on or about the various farm holdings or independent lands



From a photograph

DARK DORKING COCK

Owned and bred by Herbert Reeves. The winner of many prizes

WHITE DORKINGS.

The property of MR. O. E. CRESWELL.

The Poultry Book

By

HARRISON WEIR, F.R.H.S.

American Edition Edited by

WILLIS GRANT JOHNSON

Assisted by

GEORGE O. BROWN

as Associate Editor

and

Many American Experts

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This book has been revised and rewritten from the American point of view by American experts.

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"Kent, Sussex, Surrey, and Dorking Fowls"

"Some Scotch Fowls"

KENT, SUSSEX, SURREY, AND DORKING FOWLS

"Old fashions please me best; I am not so nice,
To change true rules for odd inventions."—TAMING OF THE SHREW.

BONNINGTON MOWBRAY (John Lawrence), writing in 1824 of the Darking (or Dorking) fowl, says: "It is so called from a town in Surrey, where probably the variety was first bred, and where and in its vicinity they are to be found in great plenty and perfection. It is in a third degree the largest of our fowls, well shaped, having a long, capacious body and short legs, and is a plentiful layer." *

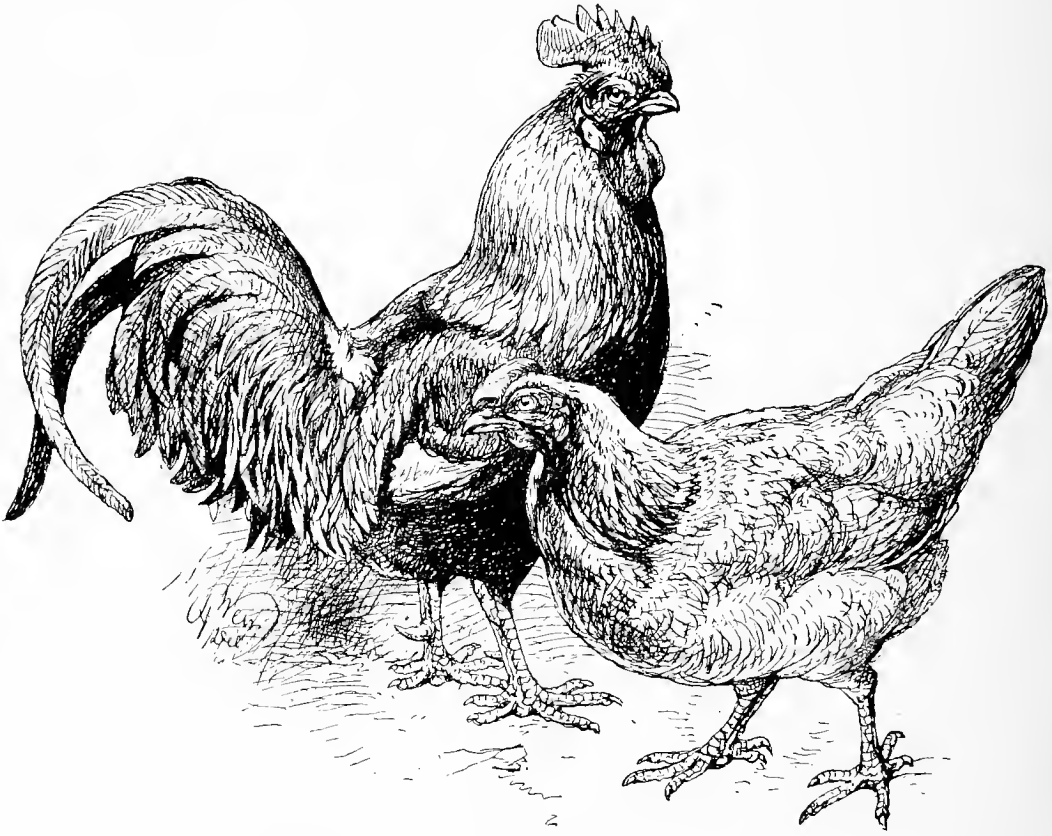
This is precisely the description of the Kent, Sussex, and Surrey fowls given previously, which is not in any way peculiar to the Dorking, nor is the fifth toe. Mowbray states: "The genuine color, entire white; chief distinctive mark, five claws upon each foot." He adds that "the white is not so pure as certain of the dunghill fowls, nor is the flesh, that inclining to yellow or ivory shade; the Darkings are the species generally made into capons."

Any one reading this would doubtless be led to believe that the cockerels of this breed were those principally used for caponizing, whereas the Kents and other southern breeds were so noted for centuries; and the prices also for such capons are given in Professor Thorold Rogers's excellent book of "Ancient Mediæval Values of Farming Stock," occurring as far back as the thirteenth century. Again, Mr. Mowbray states that an attempt was made to deprive Dorking of the honor of the breed, etc. "The surveyor pretends that the Dorking fowls were all raised in the Weald of Sussex, and that Horsham is the chief market for them."

This, as has been shown, was undoubtedly the case. Further he says: "No doubt it is probable that having five claws accidentally brought certain fine and well-formed individuals into notice, but from these proceeded a distinguished permanent variety, and that variety

* Here it should be noted that Mowbray mentions the Dorking as in the third degree the largest of our fowls.

bearing the name of Dorking seems a sufficient proof of that town and its neighborhood." This is fairly jumping at a conclusion. As to the five toes, they were the common appendage, not only of the fowls of Kent, Sussex, and Surrey, but also of other breeds, of France, Spain, Italy, etc. How, then, could this form be noted as distinctive? To make



COCKEREL AND PULLET, OLD-STYLE PRIZE DORKING OF 1853

the statement even more doubtful, presently, when writing of the Polands, he asserts: "Perhaps the genuine sort has always five claws,* and as the Poland cock will produce occasionally white stock from white English hens, it is not impossible, the similarity of form likewise considered, that

* I have seen Polands not only with five toes, but also "spurred" like a cock. A hen at the Crystal Palace Show, in 1900, had a very large spur on one shank only, and no indication of one on the other.

our famous Dorking breed may have been originally from that cross, and, supposing such speculations groundless, the Dorking, differing as it does from the common, may have been an imported breed."

This is what Mr. John Timbs, F.S.A., author of "Things Not Generally Known," and who lived some years at Dorking, says in his valuable description of Dorking, 1824: "An incredible quantity of poultry is usually sold at the weekly markets. This trade is chiefly in the hands of a few individuals, who regularly attend and supply the London dealers. There is also a breed of fowls with five claws, well known among the poulterers of the metropolis by the appellation of 'Dorking fowls'; one sort is perfectly white and another of a partridge color. Columella, in his 'Husbandry,' describes fowls of this kind; and it is conjectured that they were originally brought here by the Romans." Knowing Mr. John Timbs, I asked if these fowls were all bred at or about Dorking, when he told me that many were brought from long distances to the town to be sold, and that by no means all or anything like it had five toes, and he fully agreed with me that they were precisely the same breeds as the Kents and Sussex, and that they also were brought over by the Romans.

Mr. Walter B. Dickson, writing of this bird in 1847, says: "These fowls, which form the principal supply of the London market, are distinguished by having five toes instead of four on each foot." Nor does he stand alone in this statement, for it is the common assertion of most modern writers on poultry even to this day; but it is more difficult to understand how Mr. Dickson could have fallen into so great an error, when he quotes Temminck, Buffon, and Bechtien, who surely, when writing on the subject of fowls with five toes, were fully aware of numerous breeds that have the extra toe not belonging to the widespread variety now commonly and erroneously called the "Dorking." For there are other breeds, quite different in their general aspects, that also possess the fifth toe. Therefore I dismiss the subject so far as it is a criterion of the breed to be found in the so-called Dorking only, and have little or no hesitation in believing that it was the ordinary large fowl of the southern parts of England, so numerous in the counties of Kent, Sussex, and Surrey, which are all eminently celebrated for the excellent quality of their poultry. It has also been averred that a property of the so-called Dorking is the large size and generally bulky appearance of those denominated "colored Dorking," and which have given place of late years at poultry shows to one

variety—the dark gray, the hens especially being almost black, with white quills, stems, or mid-ribs to their feathers, and also the very beautiful cross-bred silver-grays. The double or rose-formed crest has been suspended in favor of the high, deeply serrated single comb. A writer in Rees's "Cyclopædia" (Vol. XXVIII.) thus gives his opinion of a Darking breed, as the town was sometimes called:

"Dorking fowls, as they are called, are all raised in the Weald of Sussex, but the finest market for them is Horsham. The five-clawed breed have been considered the best sort; this is, however, a great mistake, and it took its origin in some fowls of this peculiarity that happened to be very large and fine, which laid the foundation of what has since been called the Dorking or five-clawed fowls, and considered in other parts of England as the prime stock, but such a thing is hardly known in Sussex; it is a bastard * breed which is used at the table of Lord Egremont, and have very frequently, it is said, astonished the company by their size."

Here again error creeps in, the five-toed being by no means confined to Dorking, and those of Lord Egremont were simply the true breed. After the most searching inquiry, I am led to fully believe that the four-toed varieties of barn-door fowls were the bastard breed, and were most probably a cross with the English white-shanked Game-fowl, which was resorted to sometimes to give increased vigor. Again, the Dorking fowls proper, if any, were a smaller breed, and, as Mr. W. B. Dickson observes, were almost always white, their legs short and remarkably smooth. In the engraving of the Dorking fowls, from a drawing by Edwards in Rees's "Cyclopædia," the birds are white with rose combs and slight "lark" crests, and it is generally admitted that these albinos were the breed of fowls for which the town of Dorking was, if ever, held in such repute; at the same time, and which must not be overlooked, it is also a fact that it was one of those large "fattening" centers for which the south of England was and is to this day so celebrated, and to which I shall hereafter allude; also that most of the poultry so fattened were bought principally at the Horsham poultry market, which is even now one of considerable importance. And formerly, as I have shown, instead of Dorking being the most celebrated breed of fowls, it appears the Kentish were considered superior. William Lambarde, in his "Perambulations of Kent" in 1576, after eulogizing the cattle as being the largest of their

* How bastard? If so, how bred?

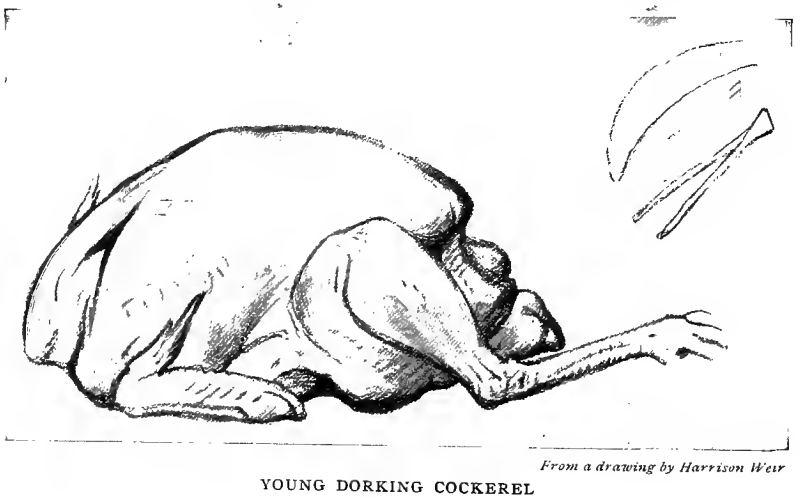
COCKEREL AND PULLET, PRIZE-BRED OLD KENT
Showing fine form and breast

kind, states: "The like whereof also Polydore * in his history confesseth of the Kentish poultry." Izaak Walton, also, in his book on "Fishing," mentions that the Kentish poultry were even then of unusual size. The old "Tunbridge Wells Guide Books" state that the fowls sold there were large and good. Nor is this to be wondered at, for if Dorking is said to have obtained its breed from the Roman period, is it not as much or more likely that Kent, possessing as it does a Roman road throughout, should also have had some of the ancient breed mentioned by Columella? And indeed the five-toed varieties, as stated, are not by any means confined to England.

* Virgil.

As conceded, Dorking may have had the credit of a certain breed of white fowls with rose combs, but to say that all the white or colored varieties of fowls are Dorkings, or that the latter have emanated from them, is simply absurd; for all the Dorking fowls were not even five-toed, though many undoubtedly were; but so also were the Sussex, Surrey, and Kent. Over fifty years ago it was well known, and often stated, that breeds of fowls with five toes were kept in the same neighborhood, both in Kent and Sussex, from generation to generation. Dorking, as far as can be ascertained, was a place chiefly for table fowls, obtained from several breeders living many miles away, and carried there by "higglers" to fatten for market, but not bred there.

Mr. Arthur Young, writing on the subject of poultry in the beginning of the last century, among others mentions a Mr. Boys * as possessing a fine breed of fowls; and it is a curious fact that the Reverend J. Boys, of Biddenham, Kent, was among the first to take prizes under the name of "Dorkings." When the Zoölogical Society instituted poultry shows prizes were offered for Kent, Surrey, and Sussex fowls; many with five toes were exhibited, and foolishly disallowed by the judges calling them

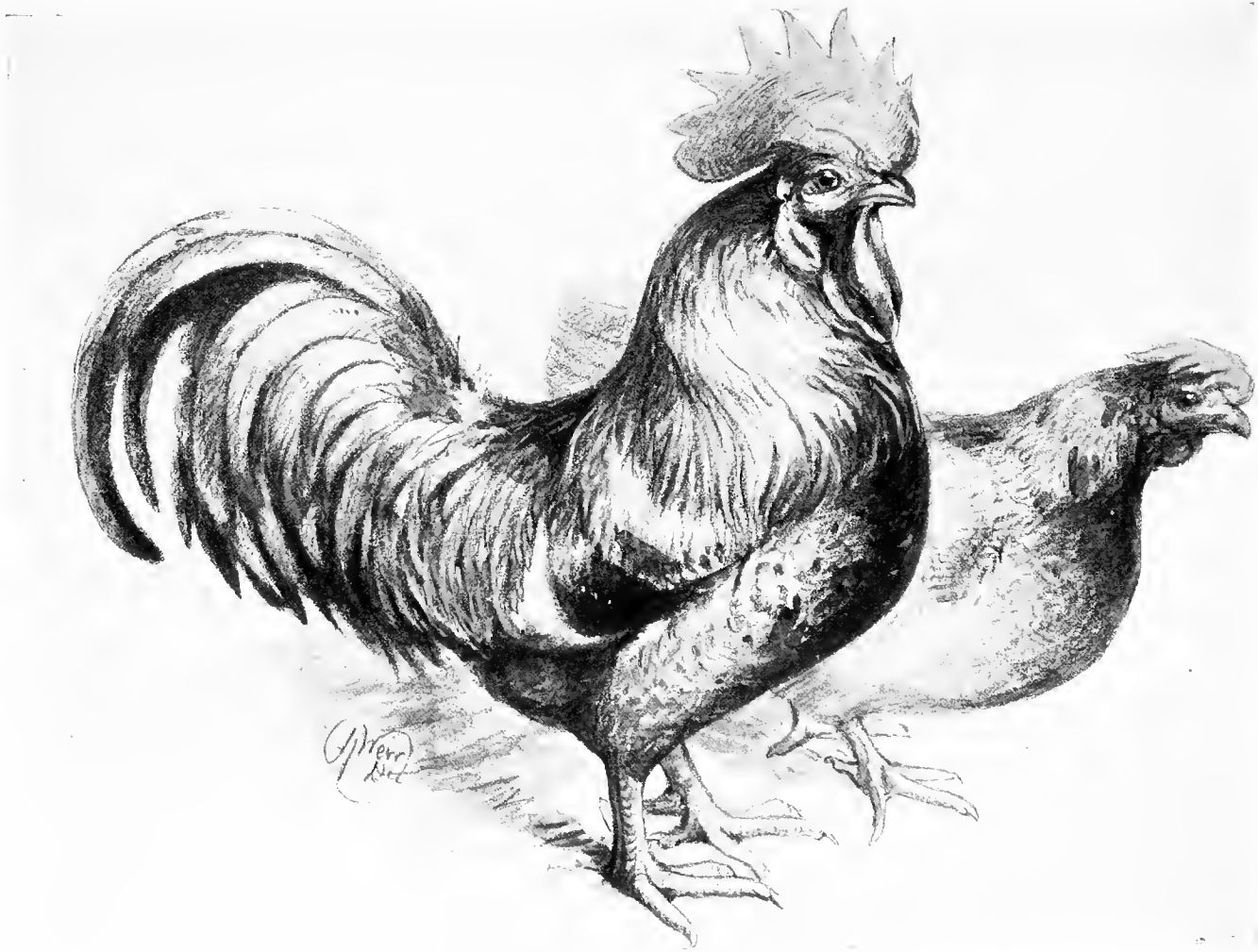


From a drawing by Harrison Weir

YOUNG DORKING COCKEREL

Dorkings. Where did Mr. Lewry get the Dorking fowls he won with at the poultry shows but from the farmers of Kent and Sussex? Not from Dorking. One of the greatest evils that befell the splendid, large, well-

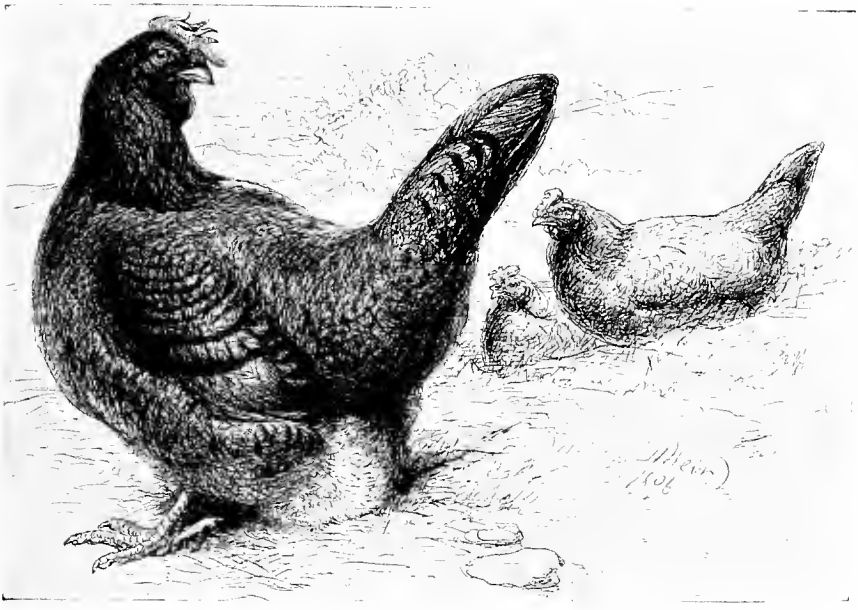
* See notes on Mr. Boys in previous chapters.



OLD ENGLISH FOUR-TOED COCK AND HEN

Once owned by Mr. Weir

formed, active, and profitable table fowls of the southern counties was the introduction of the Shanghai or Cochin. The "higglers" procured cocks of this breed, and prevailed on many of the Kent and Sussex farmers to cross them with the grand old fowls that were before the perfection of the barn-door breeds. One of the greatest sinners in this respect was this Mr. Lewry; and many were the Dark Cochins that he has been known to sell or exchange with the Sussex and Kentish men for some of their very best fowls, and with which he stocked a number of now high-class



OLD KENT DARK-RED HEN AND TWO OTHERS

poultry yards; but with some of these he also gained a "Dorking" notoriety and prizes as a successful breeder, while the old stocks from which he drew his supplies were (for the time, at least) utterly ruined by the Cochin cross; for though it possibly somewhat (which I deny) improved the size, it was at the cost of flesh quality and increase of bone and offal.

Having at various times visited several "out-of-the-way" places in Kent and Sussex and noted "here and there" some of the old short-legged breeds that once were so common in almost every farmyard (bright, lively, active, square-made, large-breasted birds, light of bone, good foragers and hardy), to-day I scarcely know where to look for these;

nor where are the old speckles or spangles (truly beautiful fowls), or the reds or cinnamons, the light grays with speckled breasts, or the browns, many with bright rose combs; or the old single-combed whites, with thin white shanks, the cocks with large flowing tails. (The portrait of a cockerel of this breed, from one of mine, appeared in the "Poultry Book" of 1852–53.)

Where are all these? Where are to be got the snow-white, fine-flavored eggs, whiter than the cloth they were wrapped in? Gone! "Nobody buys any but brown eggs now," said a henwife to me a few weeks ago, when I remonstrated with her on the breed of fowls she kept. The mongrel things were fairly good layers of light-brown eggs, and so her old south breed had been parted with; for living near a country town, she could make more money of her brown or tinted eggs; and as to her fowls, as table fowls, well! "it made but little difference that way," for but few of her town customers realized whether they were good, bad or indifferent when trussed for cooking, with broken ribs and crushed breast-bone.

And all these colors, forms, and varieties are now scarce or gone—at least, I know of but few; true it is there is the "Show Dorking," as it is called, a large, heavy, cumbersome bird, bigger in bone, meaty, deep-breasted, and as some aver hardier; it is a grand bird, doubtless, and worthy of great praise; but "is it a better bird in all respects than the old stock bird of the Kent, Sussex, and Surrey farmyards?" Does it forage so well? That is a point worth noting. Is it not more coarse in flesh and feather? Does it not "go wrong" in its feet frequently? while such a thing was scarcely or ever known in "the old five-toed" fowl.

The old breed could fly well, and generally roosted in the trees, stood up and crowed at the "proper times" as old English fowls should—"they of the olden time." I have had a cock weigh thirteen and a half pounds, and a hen of eleven pounds when taken up from the poultry run; and these, as far as I know, never had a taint of the Shanghai or Cochin blood.

Why was the term "Colored Dorking" taken out of the show schedules and "Dark Dorking" substituted? Why was one color made to take precedence? Why should the speckles, the reds, browns, and other colors be stamped out of existence by the "whims and fancies" of certain judges, etc., and no other five-toed fowls of the old English breeds be considered worth keeping but the cross-bred dark, colored, and gray,

the silver-gray, and the white? Were poultry shows only instituted for such as these?

At one time the four-toed Surrey fowl was greatly in demand; where is it now? We are told, by those who are said to know, that the fifth toe is the cause of the lameness of the so-called "Dorking"; if so, why then was the old English Game-fowl lame from gout, as the old books on "Cocking" testify? There is no doubt that the real and simple cause of the gouty or "bumble-foot" in the exhibition Dorking comes principally, if not altogether, from feeding, food-"forcing," and high-perching. Long experience and close observation make it difficult to believe that the fifth toe has but little, if anything whatever, to do with

Drawn by Harrison Weir from a picture in Rees's "Cyclopædia"

A PAIR OF WHITE DORKINGS

the foot disease, which was unknown among barn-door fowls, though having the fifth toe, but kept in a natural way; yet the hind toe was then, as now, largely and very fully developed, as also spurs on the hens of considerable size and sharpness.

From a drawing by Harrison Weir

PRIZE DORKING HENS
Bred by Fisher Hobbs and sold to H.R.H. Prince Albert

Nor are these modern crosses better for early chickens; for in 1815 Mrs. Adams, of Shipton-on-Stour, always had chickens ready for New Year's Day. This is remarkable, but by no means uncommon with the old Kent and Sussex henwives, the birds being reared in the dry sheds about the farmyards. As late as May, in 1827, the price of poultry ruled high in London markets, young fowls being sold at 18*s.* the couple and ducks equally dear. To remedy this, shows for dead poultry were instituted for fattening, those of Earl Spencer being the most successful; and it is a common fact, which should not be lost sight of, that the points of excellence noted in the schedule for prizes are almost identical with those taken from Columella and other writers of 1580, 1581, 1600, 1616, 1670, and so until 1790, 1810, 1820, and 1827, as: "The fowls should be plump, deep, long, and capacious in body, with short white legs of small-sized bone, of very white, juicy, fine-grained flesh, the fat and the skin equally white and of delicate flavor."

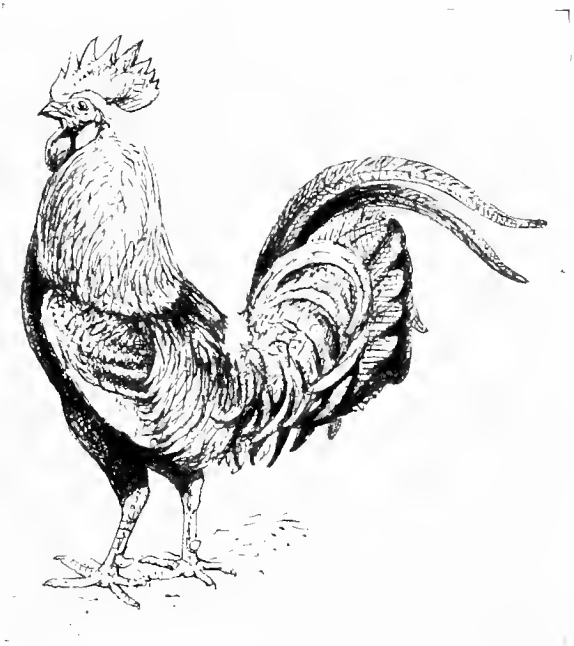
"All the birds to have been bred in Northamptonshire and to be shown alive." It concluded with this instruction:

"Small-boned, well-proportioned poultry greatly excel the large-boned, long-legged kind in color and firmness of flesh and delicacy of flavor; for it is held good that of all animals of the domestic kind, those which have the smallest, cleanest, and finest bones are in general the best proportioned and are covered with the best and purest meat; besides being, in the opinion of good judges, the most inclined to feed, and fatted

with the smallest proportionable quantity of food to the greatest comparative weight and size."

After a while these shows were followed by other utility shows at the Zoölogical Society's Gardens, Regent's Park, when again the excellence and variety of our "utility" fowls were duly recognized, and all the before-named requirements were taken into consideration.

At the first live poultry show held at the Society's Gardens, June 6, 1845, there were classes for Speckled Dorkings (then plentiful), Surrey, Kent, and Sussex fowls, all for table purposes—the Dorkings and Kents being awarded first prizes, Messrs. Baker, of Leadenhall Market and Chelsea, winning for Hamburgs, Black Spanish, and Madeiras; they were also commended for Chinese and Madeiras. I was present; and these latter appeared to be nothing else than a variety of what is called the Minorca and the Black Spanish. The Bakers also won with their feather-legged Bantams; Mr. Tyler, of the Surrey Zoölogical Gardens, winning a first prize with "Polish"; Mr. Nolan was second with Malays; these were very different from Messrs. Bakers' Chinese. Several varieties of Bantams were exhibited, including gold and silver spangled as then called, not laced and true black Bantams, nor pygmy black Hamburgs now known as such. The show was held on the left-hand side of the long walk at the back of the bear pit, near the boundary of the gardens; there was no tent or covering. The exhibition was well attended, and considered to be successful. The judges were Mr. John Baily, who afterward took a prominent place at



From a drawing by Harrison Weir

PRIZE DORKING COCKEREL
Bred by Fisher Hobbs and sold to H.R.H. Prince Albert

the many and various shows, the offspring of this the first attempt at a utility and fancy gathering, and who for so many years strongly advocated the merits of the so-called "Dorking" as the very best of table fowls; Mr. George Fisher, well known as an excellent judge of pigs; and last, but by no means least, the gentle and kind-hearted Mr. William Yarrell, V. P Z. S., the author of "British Birds and British Fishes, and Monograph of the Salmon." Here are the names of some of the prize-winners:

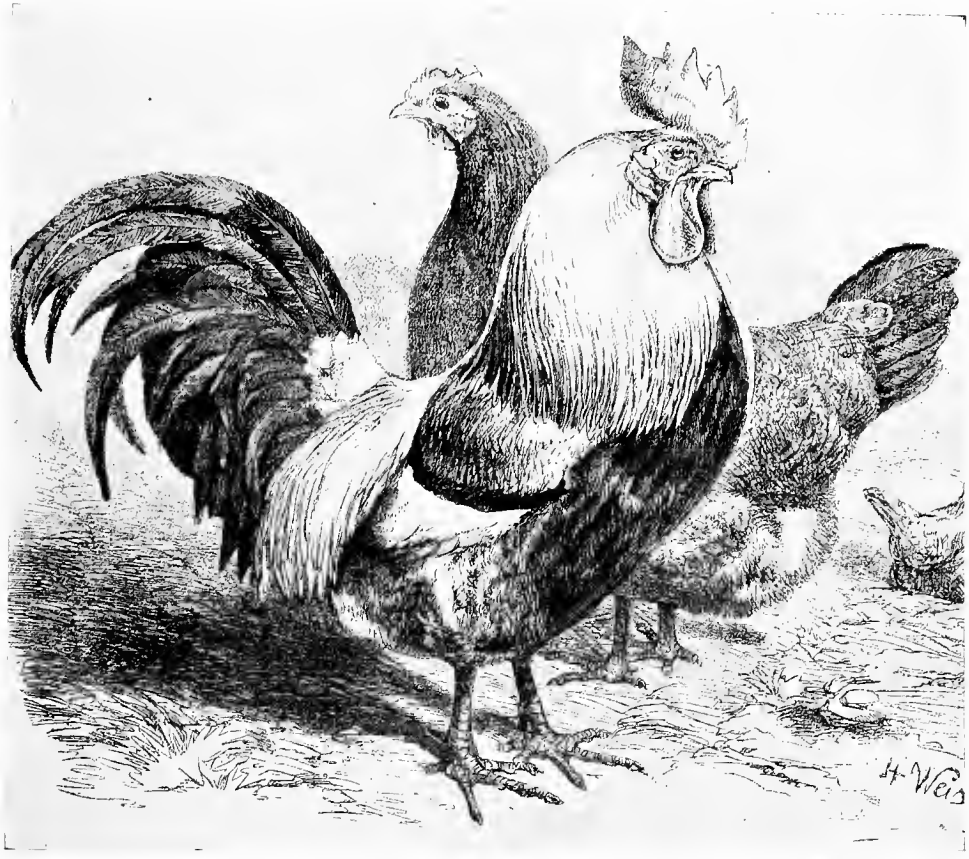
Prize	1.	Speckled Dorking	Class A.
"	2.	Surrey (Bartlett)	" B.
"	1.	Kent (Miss Cooper)	" C.
"	1.	Hamburg (Bakers)	" H.
"	1.	Black Spanish (Bakers)	" E.
"	1.	Polish (Tyler)	" E.
"	2.	Malay (Nolan)	" E.
"	1.	Chinese (Bakers).	
		" (commended) (Bakers).	
"	1.	Spangled Muffled Fowls, Bantams, etc.	

Also varieties of coops were exhibited.

This was considered to be a step in the right direction, as the show was instituted for the purpose of insuring the purity of breeds, and the more careful production of poultry of the greatest utility and perfection. At the same time, it was admitted that our southern white-legged farmyard stocks were, in many instances, exceptionally good, and as table fowls unsurpassable; nor was it possible for these to be more carefully selected, mated, bred and reared; to which the vast number of market fowls, both in form, color of flesh, skin, fat, and shanks fully testified. Moreover, if a "Game cock" was taken "to walk," it was contended that he must correspond somewhat in color with the home birds, and have white shanks, etc. The farmsteads, too, would not keep any mixed variety that was not considered to be of the best for sale to the higgler, and good early layers, as they were looked upon not only as farm-house luxuries but also as channels through which considerable profit was derived. When the first show was held at the Zoölogical Society's Gardens, the fowls from Kent, Sussex, Surrey, and the so-called Dorking gave ample proof that they were to be had in plenty and of a quality which left little to be desired. It has often been stated that our barn-door fowls were small; this might be the case in some instances, but those of Kent and Sussex were not usually so, the cocks often weighing more than ten pounds, and

the hens eight, and in some instances even more. Latham writes of a Dorking in the last century that weighed more than fourteen pounds.

In 1847 the Zoölogical Society held another show in their gardens, which was again successful, and, indeed, led the way toward and induced



By permission of the proprietors of the "Field"

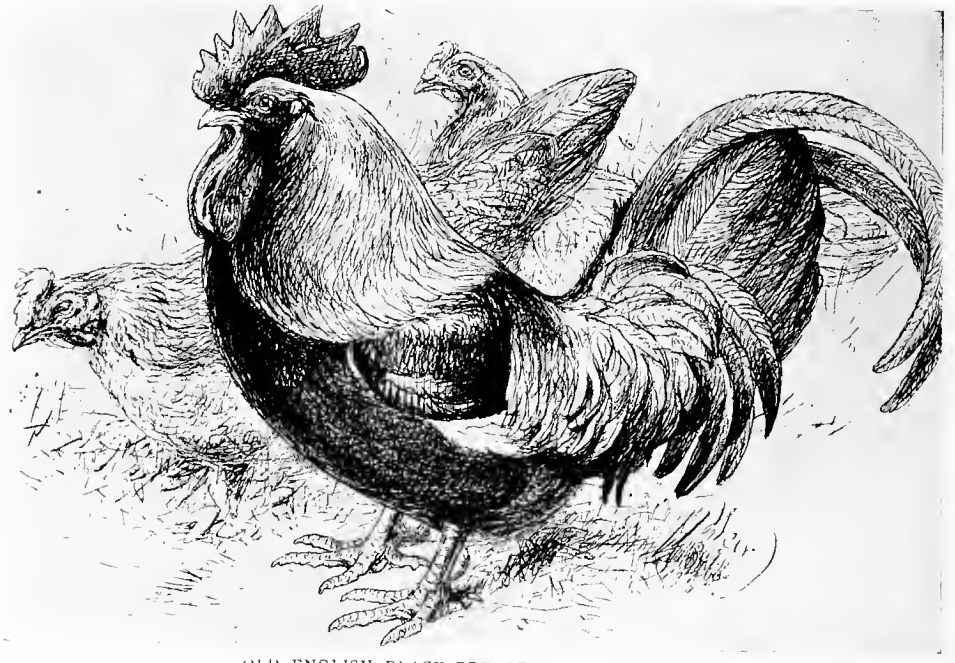
THE HONORABLE MR. ASTLEY'S GRAY DORKINGS

the Birmingham Cattle Show Club to add poultry to their Christmas exhibition, which they did in 1849.

At the Zoölogical Society's show the most approved were Sussex (which had in some cases five toes), Surrey, and Kent, and the so-called Dorking, nearly all of which were of excellent quality and of rich coloring, but mostly shown young, the exhibitors being under the impression they were better as table fowls. They were immature birds, not having full-

grown tails, etc., and so not presenting the grand appearance that the southern barn-door cock usually attained in his second year, nor having the massive frames so characteristic of these much-prized birds; yet Messrs. Baker, of Chelsea, had an extra prize, while Mr. Lewry,* of Handcross, Cuckfield, Sussex, was the winner of two prizes, with very fine large-framed, well-formed, short-legged fowls, very clean and white in the shanks. In point of fact, all the table poultry was good in quality excepting the White-faced Black Spanish. The lofty-standing Malays of Messrs. Baker received much attention, they being very rich in color.

The chief object of the show was the encouragement of the breeding of the most approved sorts of table fowls; therefore, as might have been expected, the Dorking, Surrey, Sussex, and Kent barn-door formed the



OLD ENGLISH BLACK-BREASTED RED DORKINGS
Once owned by Mr. Weir

principal and most interesting part both of this and the former exhibition; and the improvements in showing, in size, quality, and pureness

* Mr. Lewry was of a family of "higglers" and poultry "fatters," and frequently bought fowls and chickens of my friends and relatives before-mentioned, some of his best and purest-bred prize birds coming from their farmyards and homesteads.

of breed elicited from the judges a very decided opinion of high approbation. It was also a matter for much congratulation to find that our farmyard produce was in so satisfactory a state, so much so that the society thought that they had done enough to demonstrate the fact, and that in future poultry would be found a worthy and profitable adjunct to farming, especially in what is termed the home counties, as indeed at this time some of the best fowls ever sent to market came from the English homesteads, grown by farmers' wives and daughters, not by mere fanciers, but as good and serviceable stock, and by no means to be neglected as sources of income. Then came the Shanghai fowls and the craze for size, novelty, and colored eggs; and ill it fared with our old breeds. The Shanghais were taken to the English homestead as desirable crosses to get size and, as some said, hardiness, whereas no one ever complained of any tenderness in the old birds but those ignorant of the proper treatment of chickens and how to rear them. Seldom was it that broods were seen of less than eight or nine, while they often numbered ten, twelve, sixteen, and I have known twenty all hatched by one hen. The Cochin or Shanghai craze was the first blow that our ancient and almost perfect farm poultry received; though every effort was made by such men as Mr. Baily, Captain Hornby, and others to keep the breeds from contamination, the wave came on nevertheless, and in too many cases the damage became irreparable, while fortunately in others some few of the Kent and Sussex breeders would have none of them.

1850 AND 1860

"O, what men dare do! What men may do!
What men daily do, not knowing what they do."
—MUCH ADO ABOUT NOTHING.

At this time the Shanghai "took the lead and kept it," and its merits, greatly exaggerated from the first, were still further extolled, until it was averred that there was no property that a good fowl should have but this possessed it; it was delicious roasted or boiled, and the hens laid two or three eggs a day. All this tended for a while toward the depreciation of the fine old English fowls of Kent, Sussex, Surrey, and Dorking. Nor was this the worst, for many farmers, poulterers, and others, finding the Shanghai so much in request, and stimulated to do so by writers on and about poultry, unhesitatingly crossed the old breeds with the new and coarser birds; and to such an extent was this done that many, if not most,

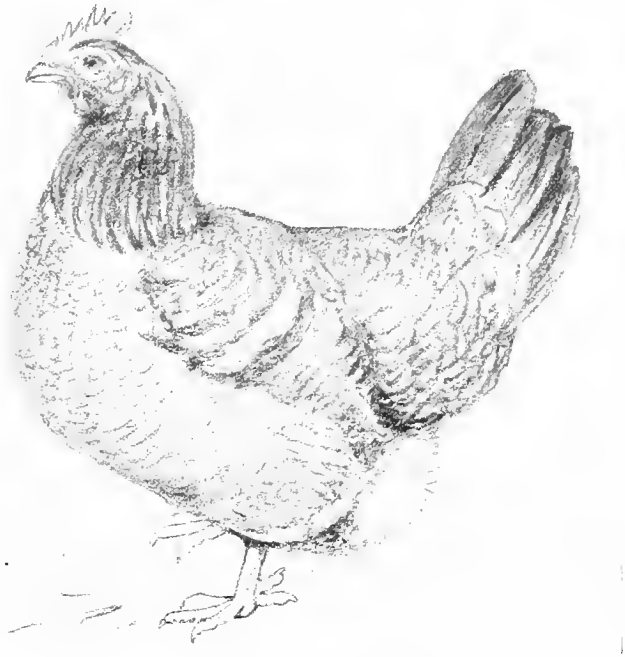
of the larger five-toed fowls were more often than not half Shanghai; not a few were seen in the show-pens with unmistakable scars on their shanks and toes where feathers had been removed and in some cases filled in with wax, while the sides of the shanks, though clear of feathers, were too often of a deep pink or red color, as though they were in some way suppressed. Such crosses were also visible in the combs, being more of the Shanghai or Cochin shape. Yet through it all the grand old English birds held their own, and with the exception of the White-faced Black Spanish and the Cinnamon or Buff Cochin, had prizes of the same value offered, and for table purposes were pronounced by the best judges not only able to maintain their high position, but when pure bred were unrivaled—the magnificent birds of Captain Hornby, Towneley Parker, Reverend J. Boys, L. Lewry, Sir John Cathcart's speckles, Christopher Rawson and Thomas Potts, Mrs. Arkwright and, later, Lady Holmsdale, with those of Mr. Fisher Hobbs, who latterly spoiled his strain by the Cochin or Shanghai cross; though this was denied, yet such was the fact, Mr. Fisher Hobbs * himself telling me that he had used a Dorking cock to a Partridge-colored Shanghai hen, and from these some of his prize-winners were bred. At this time (1853) the Dorking, etc., were again coming slowly to the front and winning favor entirely on their own individual and collective merits, though the rose-combed birds, the brilliant reds (of which Mr. Tegetmeier once wrote that a cock of this breed was "indeed a beautiful sight"), the tawnies, and the ancient breed of speckles were pushed out by the cross-bred silver duckwing grays and whites, until the old and lovely color was never seen in the show-pen, but only found in some of the homesteads of the better class of Kent and Sussex farmers.

Thus it was that the real and wonderful merits of the southern birds became more and more recognized, and for a while were in request, when Mr. John Douglas † bought a white-shanked, very dark-colored, nearly black Malay cock at the London Docks, and by crossing this with some Dark Dorking hens again brought more foreign blood into the old English breed; his boast was that he got much darker and richer colors and heavier birds. Though this has often been asserted, still the fact remains, before

* Mr. Fisher Hobbs sold his Dorking eggs at 5*s*. each, packing included.

† Mr. W. B. Tegetmeier states that Mr. Douglas obtained the Malay from the Zoölogical Society's Gardens, but Mr. J. Douglas told me himself that it was not so, but that the cock was bought at the docks; and as he was the buyer, owner, and raiser of the cross-breed, I prefer to take his statement rather than that of Mr. Tegetmeier.

mentioned, that there is a record of a Dorking weighing fourteen pounds as far back as the beginning of the nineteenth century, and cocks weighing more than twelve pounds and hens more than ten pounds, and these of the pure old farmyard breed without a cross, were in evidence. This crossing and recrossing had the baneful effect of rendering the breed unreliable. Then it was that the mongrelization became apparent in dark and sooty shanks and feet, and that being more often in the larger birds than the old and true, the judges gave the prizes to avowed cross-breeds, although the shows were instituted for the perpetuation of "pureness of breed and fineness of quality, mere size not to be considered." Here is Mr. John Baily writing in the *Poultry Chronicle*, 1854: "It may seem at first sight that two combs dissimilar as possible should be equally pure, but it is not the less true. I do not object to a cup comb, and the fact proves it, while the contrary is only supported by bare assertion. Some have said that the rose combs arise from a Malay cross; but if there be any truth in this, can its supporters explain how every indication of the cross has been got rid of?" Further he says: "There is no color for Dorkings, and only two are excepted: they are the black and white; the latter are a distinct breed." (Just so, it is said that the latter are the only true, if any.) "Yet," adds Mr. Baily, "while every color is



From a drawing by Harrison Weir

OLD KENT FIVE-TOED HEN

admirable, care should be taken to match the birds composing a pen with due regard to uniformity."

Here is the opinion of Mr. Baily, who was considered to be one of the best judges of table fowl at that time (1854). He knew well that certain breeders and farmers had colors and strains which they preferred and which they kept true; his knowledge was of fact, and his, like my own, was from actual observation, not merely stating from hearsay, like far too many writing on the subject both then and now, most of whom never saw the old stocks of red and brown or other colored birds that were numerous even then in Kent, Sussex, and Surrey—men who were "writers" only, and not, as Mr. Baily, of long, sound, practical experience as poultrymen and poulterers; had his advice and dictum been attended to, as it should have been, we might still have had in table fowls the fine rich colors of the more olden times, besides retaining the full-fleshed forms and square-made, short-thighed legs and medium-shanked birds, with all their attendant good qualities. Mr. Baily goes on to say: "One of the most popular colors for hens in the present day is that known as Lord Hill's. These are 'silver-grays'; in point of fact, they are duckwing silver-grays, and were a cross between the old duckwing silver-gray, white-shanked, pearl-eyed old English Game-cock and the gray Surrey, Kent, and Sussex. The silver-gray 'proper' has no steel-black bar on the wing. The next class is the grays, and," continues Mr. Baily, "with all these the most desirable match for a cock is one with light hackle and saddle, dark breast and tail; I advisably say dark in preference to black because I think servile adherence to any given color too often necessitates the sacrifice of more valuable qualities." (This is quite right, and in a table fowl especially so.) "I look on a fine Dorking with no less admiration if his breast is speckled and his tail composed of a mixture of black and white feathers. and such a bird is a fit and a proper match for any gray hens." This is precisely my own opinion; the Kent, Sussex, Surrey or colored Dorkings should be shown now and then of any colors that suited the fancy of the rearer, provided that the whole "pen" match in comb, color, form, shank, and feet. This Mr. Baily said in 1854, and so acted one of the best judges of table poultry ever known. He then notes the chocolate and the black white-speckled of Sir John Cathcart*: "Another speckle—a grayish-brown spotted with white, and brown hens with black-breasted red cock

* White-spangled blacks, others white-spangled of colors.

cuckoos, etc." It is well to bear in mind that this is the unbiassed opinion of so eminent a judge both of live and dead poultry, and goes to show that the old colors could be shown with success as late as the fifties, and even

From a drawing by Harrison Weir

PRESENT-DAY PRIZE DORKING
The winner of a silver cup

later, before "fancy" and other committees unwisely interfered by restrictions made to meet the darker hues and feathering brought to notice by the larger Asiatic crosses. Here is Mr. Baily's description (1854) of the other form of one of the finest breeds of table fowls ever produced, and which is identical with that bred for centuries in England:

"In shape, the body, divested of head, tail, and legs, should give a square.* The head should be fine and intelligent, the face plump and round, the legs short, the tail ample and carried cheerfully; neck short, increasing in bulk till it is lost in the breast; it is not placed on the shoulders as in some breeds, but loses itself in the body, helping to form the prominent and full breast for which these fowls are famous."

All this was true—perfectly true and accurate, and with such a breed or breeds it might be deemed impossible to improve it by adding to or crossing in with the coarser-fleshed Cochin or Shanghai. Loud and long

* Not a long, but plump, meaty breast, far the best form of all both for appearance and quality.

were the protests made by the best utility-fowl breeders, but these were written down by the glib pen of the ignorant but ready writer, and so the credulous were led to spoil, more or less, with a foreign blend so grand, so good, and so ancient a breed. Nor was this all, for another candidate appeared for mongrelizing honors in the so-called Brahma Pootra, itself a cross-breed. This, like a new doll with a child, for a while possessed all the charms of novelty; and the fine old southern breed were not crossed to improve "the Brahma," but by a curious obliquity of mental and intellectual vision it was said to benefit the already nearly perfect old English favorites, the Dorkings, etc., etc.

Thus another mongrel race of fowls came into existence, a semi-Asiatic breed with red ear-lobes instead of white tinted red on the outside rim or edge, shank and feet sometimes horn-colored or sooty white, often almost red, sometimes light yellow, with feathers, thicker bones, shorter wings and tails, less alert and different habits; even the very crow of the cocks was "strange and new." So a fresh standard of points of excellence was thought needful, and the red ear-lobes were substituted for the white, and sooty shanks and feet passed as correct or allowable by the judges (?) of the newer mongrel, and the depreciation of the old and true was, by the more modern poultry-breeder, unblushingly called "progress."

And further, by these being interbred with coarser and, though larger, far inferior fowls, the quality was deteriorated for the table, and the colors were altered. From the steel-gray Brahma came the bluer-gray Dorking and the Partridge Cochin, the dull-brown dark-grays; while from the nearly black Malay or Kulm of Mr. John Douglas came those since-named Dark Dorkings, the silver-grays being mated with the Light Brahmas; these last a different breed from the Dark, having but little alteration in the color. The old variety, known as the "cuckoo," for some time had a class and notice; but it, like the browns, the reds, speckles and spangles and the rose-combed, became neglected, uncalled and uncared for; and so it was that some of the most beautiful and useful types of our English farmyard or barn-door fowls gradually became "things of the past."

Mr. Nolan, writing in 1850, then said of the colored Dorking: "What we want and expect is size, and the colored birds have it in perfection." This was before the Asiatic mongrelization began. He derides the Reverend Saul Dixon, who wrote that "fine Dorking fowls" weighed only seven pounds, while the roadside Irish ranged from seven to nine each.

By permission of Messrs. George Routledge & Sons

THE CELEBRATED GRAY DORKING COCKEREL AND PULLET

Once owned by Captain W. W. Hornby, R.N.

Mr. Nolan says: "The cock figured above, now in my possession out of condition and in heavy molt, weighs ten and a quarter pounds; if fed and over molt it would be at least two pounds more." The editor of the *Farmer's Gazette* verifies the truth of the above. Mr. Nolan also quotes the Dorkings of Mr. William Ogilvy, then late Honorary Secretary of the London Zoölogical Society, a promoter of the breed, and who kept them for his own use and the benefit of his tenants, and that he (Mr. Nolan) had chickens from this stock that weighed eight pounds at the age of six months. "The hens," says he, "are from seven to nine pounds; they stand low on the legs; the cock is about twenty-two inches high, the hen twenty inches, with short, round, plump body, wide on the breast and back, with abundance of white, juicy flesh; nothing to surpass them as a table fowl." Here again is another tribute to the wonderful breed we had, and another proof of the mischief done by reckless crossing. He adds, "their plumage, gray, speckled, or striped, and sometimes red; and further, there cannot be any fowl better calculated to add to the profits of the farmyard, from their abundance of flesh and small offal; they are hardy, naturally climatized, and are, as their progenitors are described, 'good layers and sitters, but heavy on the nest.'" Need more be quoted to show what our breed was before the mongrelizing, by in-breeding it with such coarse and bony all-foreign fowls as the Cochin, Shanghai, Brahma, and Malay? and yet at this time (1850–53) for table fowls these were of surpassing excellence. But, like much assertion, only the truth lives; and so the old English fowls are still to be found, but with a blot on their escutcheons.

The Rise of the Dorkings

Thus writes Sylvanus in the *Poultry Chronicle*, Vol. I., page 303: "If 1853 saw the decline of the Cochins, it saw the rise of the Dorkings. These latter have occupied for centuries the pinnacle of the poultry temple, but, unfit for towns and possessing few of the startling points of plumage or shape, they remained to a certain extent unnoticed, and their good qualities were only appreciated when an unusually delicious fowl on the table caused a look-up, inquiring whether the fifth claw did not at once explain the cause of excellence. Till last year these meritorious birds were to be had for a few shillings. Witness the beautiful hens exhibited four years since by Lord Hill, which were sold for 10*s.* 6*d.* each; next, the excellent ones of the Honorable and Reverend S. W. Lawley, which were put

at £1; and many others, till the Birmingham show of 1853 and the Hitchin show of the same year. At the latter place the Reverend Mr. Boys sold his prize hen for £50. At the Midland Counties show, the Reverend S. Donne lost his prize birds, although protected by 'twenty guineas.' At the Metropolitan show, Mr. Fisher Hobbs sold his birds for seventy-eight guineas; Mr. Terry, of Aylesbury, sold his for five guineas each. Captain Hornby protected his pen by a reserve of £500; but it is beyond a doubt they would have been claimed at £100. This was the rise of the Dorkings, but their rise partakes of the quiet, every-day, and useful character of the birds themselves. While the best make the best prices, there are plenty of good, useful, pure-bred birds to be had at moderate sums.

"The increase does not spread over the whole race as it did in the Cochins; these will never go out of favor as a really good fowl for the table. It seems almost impossible that the Dorking of last year can ever be surpassed; if it can, then he would be a bold man who would fix limits to its capabilities."

From a drawing by Harrison Weir

FRONT VIEW OF A DEAD DORKING, SHOWING BREAST

At this time, also, I may add that Captain Hornby was selling his Dorking eggs at £3, and even £4 a dozen, while £2 2*s*. was almost a common price.

Again I quote: "The common sense of the public has brought back the Dorking fowl to its wonted preëminence. At the sale after the Metropolitan show, and also at the Birmingham exhibition of this year (1854), the Dorking* fowl met with readier disposal at large prices than any other bird. The public voice has recognized it as the bird for the English farmyard; it is altogether the pet of John Bull, as possessing great and good qualities without ostentation and clamor. The history of our county

* I only use the word "Dorking" as indicating the old Kent, Sussex, and Surrey five-toed fowls.

town [Derby] records no less than three poultry sales by public auction, and at each of these the Dorking fowl obtained the highest bidding—good hens selling for as much as 30*s.* each; and further, the most successful breeder of Dorking fowls is, at this moment, selling his eggs readily at three guineas per dozen. These and the Game-fowl are the true British poultry. They are racy of the soil, and come down to us, like many other good things, from a remote antiquity. If it were possible to engraft the hardihood and quality of the latter upon the size and early maturity of the former, perfection would be obtained. The veriest gourmand would ask no more, for there would be quantity and quality enough to satisfy the most capacious and capricious of appetites. Tenderness and plumpness would go hand-in-hand with juiciness. The Dorking fowl stands pre-ëminent as the fowl for the table. Those persons, and those only, who saw and studied Pen 160 at the Birmingham show of 1853 can form an accurate idea of the size, quality, and beauty of a first-rate Dorking fowl. They were the birds of the exhibition, and before them the whole tribe of Spanish, Cochins, black, white, brown and buff, 'paled their ineffectual fires.' . . . Thirty-five pounds' weight of the most delicious meat under heaven were there enshrined in their beautiful forms, and robed in plumage in which richness and grace struggled for ascendency."—*The Derby Reporter*, 1854.

After 1860, the Dorkings were said to be more massive; certainly they were larger in bone, coarser in flesh, rough and loose in feather; dark grays, silver-grays, and dark, almost black, hens with gray breasts became the fashion, and gradually classes were for these only; even in those for color, if any reds or browns were sent for competition, they were said to be in the "wrong class," though not disqualified, and as a rule "passed"; thus the craze of "outer" breeding grew, and the Malay was brought into requisition again and again. The most curious part of all this was that the different breeds engrafted on the Dorking, Kent, and Sussex fowls, as I have pointed out, was not done to improve the Cochin, the Brahma, the John Douglas black, white-shanked fowl, or lastly the dry-fleshed, scaly-feathered Malay; but with a fatuity seldom, if ever, excelled it was said, no matter how erroneously, that it was done to benefit the old English fowl—the perfection of centuries.

As is well known, by long experience, to breeders of any stock, cross-breeds bred *inter se* will sooner or later revert to one or the other of the

varieties used to produce them; and thus it was that in some cases the old English form was extinguished by the Cochin or the Brahma, and the progeny became at last like to an inferior one of either; but the old type of breed was sometimes the strongest, and the Asiatic element to some extent expelled. So it might have been, and in some instances it was, the best in form and the whitest in flesh and fat, and by other careful selections the old form was partially retained. Thus the sooty shank color was being gradually eliminated, and would possibly by this time have been nearly or quite so had the judges acted as true to the old breed as honest John Baily endeavored. But this was expecting too much; the lumpy coarseness of the cross-bred larger fowl still prevailed to the almost total extinction of the old and finer quality. Aye! and even Baily was obliged to give in to others. Breeders of experience know that when fowls with yellow shanks, feet, etc., are crossed with those of white it is to the detriment of both. If yellow is to be the outcome, it is browned or blacked; if white, it is almost the same, being blurred and stained; but if bred *inter se*, the one or the other color prevails. And so it was that when real Dorking fanciers refrained from further intermixtures of foreign blood, the old English fowl again partially asserted itself; and in some cases, where the white-shanked pit-Game-cocks were used, the produce somewhat nearly resembled our poultry of the farm before the arrival of the Shanghai, Cochin, Brahma, or the Malay crossing. Again, in the show-pens the closer-feathered, better-formed, and finer-fleshed birds were getting once more "in evidence." But this happy state of things was not allowed to last long, for, what with neophyte judges, lecturers and a press ever ready to publish the *opiniones fallaciosæ* of every agitator of variability and crossing as needful to progress or said-to-be improvement, those that upheld purity of breed as the first and chief consideration had a sorry time of it, many of whom, grown gray in the fancy, were scoffed at and flouted by those who had yet to learn the strength and value of the natural forces that are ever present and at work, enlarging or reducing either one quality or the other.

Gradually and by careful selection the Dorking has become or is becoming more valuable, and is likely to be one of our best table fowls. Again we are sometimes getting the soft-scaled, flesh-colored shanks and feet, and the general massive appearance is being regained, ample in form, but almost too much so in looseness in feathers, yet the Dorking is rising in public estimation. At present the breast-keel is too deep, as it gives

From a photograph

CHAMPION SILVER DORKING COCK

Owned by Arthur C. Major

a flat-sided appearance that it formerly did not possess, being in breast more the shape of the old English Game, which to the uninitiated looks flat, and wanting, as they say, depth; but experience and knowledge of the fowl when stripped for table show it to be far otherwise.

Of late no fowl has made more progress, both in beauty and utility, than the Silver-gray Duckwing Dorking (1887); it is truly a grand and

handsome bird and generally of excellent quality, being finer than its congener, the dark-colored exhibition variety, which is decidedly coarser in bone, flesh, and feathering. Still, the breed is a valuable one, though differing much from the old type; both were and are good when the latter can be found true. For my own part, I have a preference for the old style, liking a close-feathered, compact, square-made, smaller-boned fowl, and one which generally is both hardy and prolific.

Besides being good table fowls, the Dorkings are good mothers, and the chickens, when understood, are easily reared,* as witness the healthy flocks of chickens in our southern homesteads half a century and more ago, before the coming of the Asiatic Shanghais or Brahmas.

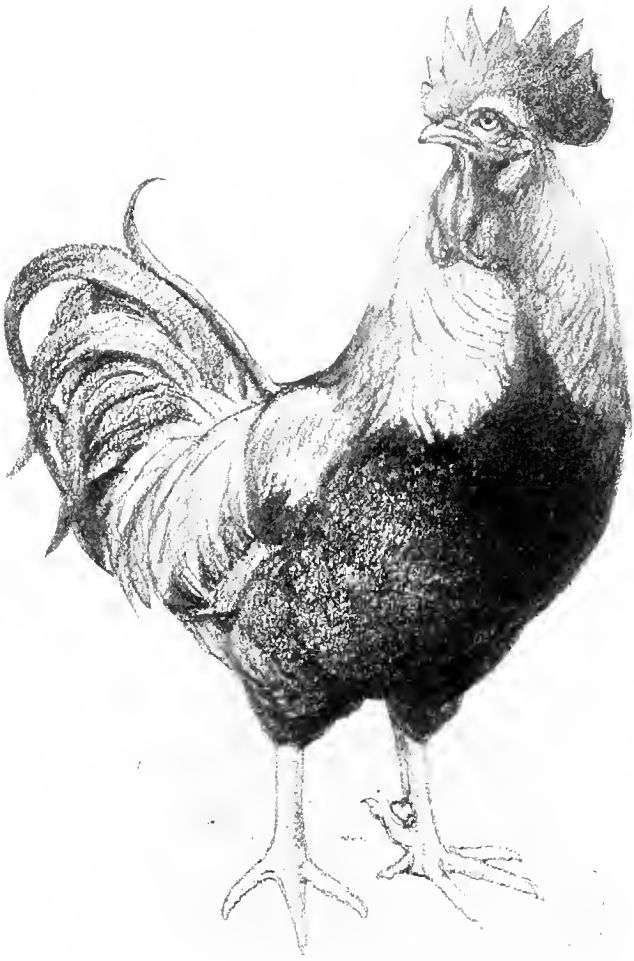
Now I will take what Mr. Tegetmeier says in the official report on the dead poultry exhibited for competition at the show of the Dairy Farmers' Association, 1892: "It is stated that the judge, Mr. John Baily" (grandson of the John Baily before mentioned), "is convinced that there is no fowl equal to the pure Dorking" (and in this he was right, as will be presently shown). "The value of this remark may be inferred from the fact that the medal for the best entry of dead poultry exhibited at the show was awarded to Miss Gubbins, of Cork, for cross-bred fowls between the Indian Game and Dorking breed,† and in the manner I have advocated for so many years. The success of this lady is not exceptional with the same strain; she has always maintained the very highest position whenever her fowls have been exhibited."

It so happened that I saw these birds, and, having the advantage of my early training, I pointed out that, although the breasts were meaty, they were lean, and that most likely they fatted in the wrong place, viz., inside. To prove whether I was right, I bought the pair. They were very carefully weighed, measured, etc., and I now turn to my notes on them. They weighed, when I got home, one, six and a quarter pounds, and the other six pounds, and were to the ordinary observer a very fine pair. They were sent to the kitchen, and my cook was told to bring me the offal, etc., to be weighed and inspected; she came up and said that in

* Here at Appledore (February 3, 1902), I have ten Dorking chickens well and healthy, although the weather has been intensely cold, rainy, and windy, and the soil is of clay, and wet.

† An illustration of this prize fowl will be found on page 22 of the present work, where it was wrongly described as a Dorking and Plymouth Rock instead of Dorking and Indian Game. The error first occurred in the English edition.—EDITOR.

all her experience—and she had had much—she had never found so much fat in the inside of any fowl. The fat alone inside * the one of six and a quarter pounds weight was just over two pounds, and with the head, neck, legs, intestines, etc., made just another pound; so this desirable fowl lost nearly half its weight in offal. I directed the cook to skewer the fat over the lean breast to help "baste it." The smaller one also had nearly two pounds of fat and offal inside, etc., and, as I anticipated, the breast meat was dry and hard when cooked. The other details are too long to go into. So much for Miss Gubbins's cross-breeds, quoted as better than the Dorkings. Mr. Baily was right, and "a long way right."



From a drawing by Harrison Weir

DORKING COCKEREL
Dairy Show, 1888

It will interest my readers to know that I wrote Miss Gubbins, pointing out the loss in offal in the Cornish Indian cross, and, after reading Mr. Tegetmeier's remarks, Miss Gubbins's reply will probably surprise others, as it

* Very fat gizzard and liver, with the pure fat elsewhere, the intestines being laid in masses of fat.

certainly did me. She informed me that "she did not keep any particular fowl or breed of them, as she only had a small back yard, and that her French cook bought such fowls as she liked and fatted them up for her own table—that was all; and she never sold any."

Afterward Miss Gubbins won with a pure Dorking, and she sent me as a present a half-bred Dorking and a Plymouth Rock, fairly fatted, of which I have notes, etc. "The French cook" sent me her method of fatting, which I have; it is all in French. I must be pardoned if I have not been greatly influenced by Mr. Tegetmeier's remarks about Miss Gubbins and her breed of fowls.

Now, lastly, I will give what I deem to be a most truly valuable

PRIZE DORKING COCKEREL OF 1885

opinion regarding our Dorkings as table poultry, and with which I most heartily and entirely agree, for it is true. Here it is. It is Mr. Tegetmeier's own opinion of the Dorking in his book, "Profitable Poultry," which I illustrated in 1853–54. Yes; it is one of the most valuable opinions he has ever given, and the honest truth, as I know by a lifelong experience.

Page 42 (1854): "For market fowls for table use the colored Dorking is unequaled.

"Many persons recommend cross-breeding fowls for this purpose of improving certain varieties. It is difficult to see by what cross the qualities of Dorkings as table fowls can be improved.*

"I have myself, however, never seen any cross-bred fowls equal for the table to the pure Dorkings."

This from the 1853 edition:

"The plan of crossing breeds for the purpose of improving them is fallacious in the extreme. By what cross can the good qualities of the Dorking be improved?

"It is said that the hardihood of birds is improved by crossing. If I state the result of my own experience, it would be precisely the opposite opinion. I have found that my half-bred chickens (of which I have reared for curiosity several varieties) have been less hardy than those of pure race which have been carefully bred from parents not related to one another. Another serious evil attending cross-bred birds is the uncertainty in the color, form, and general character of the chickens. After one or two generations they are certain to throw back toward one or the other of their parent stocks, producing worthless specimens of mongrelism."

This is true, and "the people" are now finding it so, and how cruelly they have been deceived by worthless advice as to crossing "this" with "that," and thus our very best table fowls are being ruined—permanently ruined! Here is more of Mr. Tegetmeier's advice, all true and good; but not what he advocates now.†

"I would strongly recommend persons who are at present breeding from common fowls not to attempt to improve them by introduction of one or two good male birds into the yard, but to obtain a good stock either by

* This was in 1853, of which time Mr. Lewis Wright wrote that I wished to ruin the Dorking by bringing it back to what it then was.

† See his edition of "Poultry Book," 1867.

purchase or eggs and breed from them alone, avoiding, of course, all intermarriage between blood relations."

This is Mr. Tegetmeier at his best, and this is good advice. My readers—for the good of our poultry, for the good of our country—follow it!

If the Utility Club would take up the matter with due earnestness, and try to restore the old breed, and help to maintain pure breeds of known usefulness, instead of simply wandering among "boomed" and varying mongrels, they would then achieve something that might gain the approbation of the thinking and experienced breeders of poultry either for the table or egg-production.

It has been truly said that Dorkings, etc., if kept in confinement deteriorate in size, bulkiness, and quality; but none have pointed out the reason why; the fact being, that both it and the old English Game, or any other good table fowl, must have liberty of action—such as flying,* jumping, scratching, with any or every kind of exercise to fully develop the muscles (flesh). If this is denied, then the shrinkage, for want of use, of that development ensues, and no matter how good and true the breed is, the birds if well fed become gouty, bumble-footed, inert, idle, and diseased. They are essentially in all ways a farmyard fowl of the best, and should, nay must, have to keep them always in perfection wide grass ranges, sheds, stacks, and stock-yards, with trees and coverts to roost in.

If on the farm it is needful to keep them shut up at night, then the poultry-house should be made large with tolerably high perches, so that they must fly up to roost, with a soft material for flooring, such as peat moss, or well-loosened, not gritty, mold, at least six inches deep, on which to descend; the perches must be so placed that they can fly down obliquely. In my own fowl-house I prefer four or five inches of yellow deal sawdust, which is cool and soft for the feet, and destructive of insect life. This also is used for the nest-boxes, with good effect, for the same reasons, while straw, heath, or hay has an opposite tendency in regard to vermin.

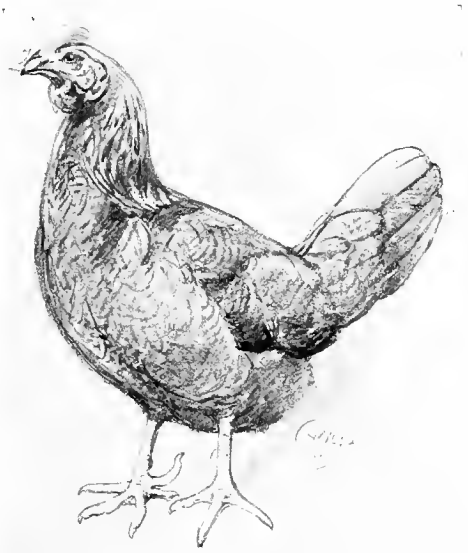
In mating Dorkings, Kents, etc., it has always been found by experience that two- or not more than three-year-old hens, of large frame, short legs, and medium shanks, are the best for the stag cock—that is, a cockerel in his second year, a full cock being in his third year. In either case he

* My present fowls fly over a six-foot wire partition easily, and the cock, wishing to come straight home from an adjoining meadow, flew across some of it and cleared a five-foot hedge by at least three feet.

should be very compact in shape, hearty, strong, and full of life. If a little less in size than usual it is not a fault, for big, bony, heavy birds are generally lethargic, and are by no means so useful, nor are they so prolific. Let the shanks and feet be of a pure white or flesh color, with *all white toe-nails; even one dark toe-nail must be strictly avoided* as well as those of a yellow tendency, as it is an indication of cross-breeding, and will almost certainly eventually produce sooty shanks and feet.

Present-Day Dorkings

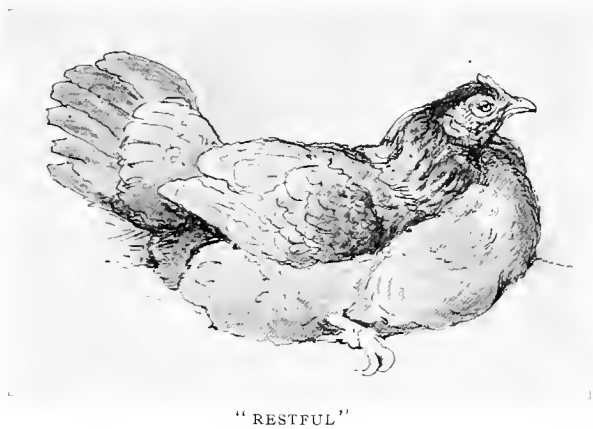
The so-called Dorking is (1898–99) gradually, and it is to be hoped surely, winning its way again into the position as one of, if not the best of, all fowls for table purposes. Much has yet to be done to restore the old form—the fine rounded breast, high quality of flesh, and the early propensity it had for fattening and finishing at a few weeks or months old. There was a fulness and plumpness in the young birds possessed by no other breed, with the exception of the old English Game, and with which there is plenty of proof that it was not infrequently interbred, losing nothing thereby, but somewhat in size, and even this rapidly enlarged when left among "the usual run" in the farmyard, though the vigor and alertness imparted by the Game-cock cross was long apparent. Thus it was that the old southern fowls, as before noted, were close-feathered, hearty and good feeders and foragers, and none the less so in such localities where Game-fowls were much in evidence. But even without any such admixture the old English breed were of super-excellence, of large size, fleshy, well feathered, full tailed, and particularly handsome.



SILVER DORKING PULLET
Crystal Palace, 1891

It was with the Shanghai cross that the looser plumage first appeared, and that as far back as 1849–50. Then again, with the advent of the so-

called Brahma, more crossing and less compactness, deeper keel to the breast-bone, and coarser, darker flesh; then the John Douglas black fowl cross, and more and more mongrelism, and so on again and again with Cochin, Brahma, and others, until the red ear-lobe self-testified the fulness of foreign bood, while the length and want of closeness in feather told but too truly the general source of the long-fiber flesh deterioration. It is with this that the Dorking fancier of the present has to combat, and from such endeavor to restore the finer texture of the breast-meat that the far too liberal use of the Asiatic breeds has so materially and so lastingly injured. This will have to be done by a reversion to the old southern breeders' tactics of choosing the best-breasted, closest-feathered, pure white-shanked, having white feet and toe-nails, with white ear-lobes, or that of infusing the blood and purest breed of the old English white-shanked Game-cock. I know of no other satisfactory means, or any with so much chance of success in restoring the fineness of flesh as this, still retaining, as it will, the full-breasted plumpness so characteristic of the grand old breed.



"RESTFUL"

A short time ago I had the pleasure of inspecting the fine flocks of Colored, Silver and White Dorkings of Mr. Herbert Reeves at Emsworth, Hants. Here was a double attraction, for this ardent and well-known Dorking fancier had just purchased the whole of Mr. Padwick's * stock of colored birds, which when united with those of Emsworth made an aggregate number of over five hundred cocks, cockerels, hens, and pullets, all well housed and carefully tended. On entering one meadow a score or more of black-breasted, silver-gray cockerels came running toward us, each and all good in form, short-shanked, and fine in color, putting one in mind of a troop of yeomanry cavalry, with their dark uniforms, white

* With these Mr. Padwick incorporated Mr. O. E. Cresswell's strain of dark birds.

braidings and facings; while of Dorkings no group of "silvers" ever showed to better advantage than they in the bright light of the morning sun when "halted" on the green turf in varied attitudes of quiet surprise. Not many yards could show their equal, as was abundantly proved at the Crystal Palace a few weeks afterward, when Mr. Reeves made "the record" in the Silver-gray Dorking cockerel class by winning all the prizes, five in number, and a V. H. C. From photographs kindly taken expressly for me I am enabled to give pictures of some of the best, also of several silver hens and a few of the darker-colored show champions. And here it would be well to observe that the difference between the two breeds was well defined, the former still showing clear evidence of the old English Game cross, used so many years ago to obtain the quality and color which they now possess in such a remarkable degree; while their heavier and darker brethren told us unmistakably, by the length and looseness of feathering and smallness of tails, with largeness of bone, how much the eastern blood still prevailed. And yet, what noble, massive, big birds they were, with a character of grandeur that no other breed possesses. In weight, many of the cocks exceeded twelve, while several hens were well over ten pounds—quite large enough for any table purposes, and for such, where coarseness is to be strictly avoided, perhaps a little more than full-sized.

In conversation with Mr. Reeves I learned that, as I anticipated, he still had some difficulty in breeding to the old style of pure white shanks and feet, though he had gone zealously to work in that direction, with the full intention of making the breed revert to what once was not the exception, but the rule.

One fact to be noted was, that the birds of the purest color and best shanks were those that had the ear-lobes of bluish-white. It was most instructive to note the peculiarities of individual birds, though all were bred to "a type"; yet, as seen daily in human beings, no two were precisely alike. To the ordinary observer the slightly apparent differences were but small, though to the fancier remarkable; while out of such a large number it was surprising how well the quality sought for was maintained, both as to size and body color. Much of this was no doubt due to careful "weeding" when in the chicken or younger state, and it is alone by such revision that anything like success can or ever will be achieved.

The Captain Hornby of to-day (perhaps a relative?) worthily sus-

tains the high character and prestige of the "Knowsley Cottage" poultry, so far-famed half a century ago, then the home of Captain Hornby * (afterward "Admiral"), who possessed in "the fifties" some of the very best close-feathered, clear white-shanked colored Dorkings then in competition. Whether the Captain of to-day holds any descendants of these I know not; but one thing is certain, and that is, he has among modern Dorkings some of the best, and not only that, but has repeatedly protested against the craze for size in the Dorking as actually depreciating the value of the breed. With this I heartily agree.

In the Dorking Club standard of excellence, recently published, there is a foot-note which for the guidance of the to-day Dorking fancier points out that the true breed should have red ear-lobes. Who is responsible for this I know not; but of this I have no doubt whatever—in fact, I am perfectly certain, that no one would make such an assertion unless they were lamentably ignorant of the origin of the true old breed. Never, until the red-ear-lobed Cochins and Brahmas were crossed into the southern five-toed fowls, was such a thing seen; and further, not any one of the show birds of the very early fifties had red ear-lobes, though slightly stained, until the time of the Douglas cross; and then but few years later the original Dorking standard of perfection says "ear-lobes whitish." It is this utter ignorance of facts that has led this and other clubs besides the Dorking not only to commit errors, but to persist in them. The so-called Dorking is a European—an old English fowl, and as such never had a red ear-lobe nor ever was so described. It was a good omen, that of whitish ear-lobes birds winning at *the last* Palace show, but it is to be hoped the Dorking Club will correct without delay their utterly erroneous declaration in their standard of excellence as to the red ear-lobe. It may be "a fad" of some foolish person who "likes to see a red ear-lobe," but to say it is the only correct color shows but too clearly a want of knowledge in those who would teach that which is not only absolutely deplorable, but must prove disastrous to the breed in many ways.

The Dorking of to-day is a large, five-toed composite fowl, the foot

* In 1858 Captain Hornby was an exhibitor at the Birmingham Christmas Poultry Show. His first-prize pen of four Dorking chickens, though in lean condition, weighed thirty-five pounds; and he also won the first prize with his Dorking hens. At this show White Dorkings of increased size were much admired; altogether, the Dorking entries consisted of 188 pens. In 1852 there were separate classes for Dorkings with rose and also with single combs.

From a photograph by Nightingale & Langley, Bucks

CHAMPION DARK DORKING HEN

Owned by Arthur C. Major

formation being considered by some of very limited knowledge as a proof of purity of breed; whereas it is no criterion whatever in that respect, there being hosts of the veriest mongrels having the five-toe appendage. What showed, and should not show, the true breed of Kent, Sussex, and Surrey five-toed fowls was the clear white fleshy shanks and feet; and of these, purely so, there was at one time such an abundance that at the poultry markets they might be seen by the score, in this respect "perfection"; while in form and quality there was nothing left to be desired. Another sign of their "blue blood" was the white ear-lobe. These were not merely "fancy points," but distinctive, unmistakable indications of the race, and

were then and before any poultry show existed known throughout the world as the very finest table fowls. In every respect they differed from others in make, quality of flesh, and general habits; but beyond all they were—I say "were" advisedly—with the exception of the white-shanked old English Game, the only pure white-shanked, white-footed fowls in existence. As such, apart from all other considerations of utility, one would have thought that every endeavor would have been made to keep such a superb variety intact, instead of which they have been more beset by the crossing-mongrel craze than any other, as though they lacked that which they possessed in extreme degree—"excellence."

There is not much more to chronicle than has already been said. But little, if any, advance has been made in quality, though the general outcome of somewhat more careful selection is an evenness of form and character that has been so long earnestly desired not only by the Dorking fanciers themselves, but by the community at large. In a neighborhood where the Dorking is "the fowl" there will most certainly be found the finest early chickens, for these, even when very young, fatten more quickly than any other, and they feather better—at least, this is my experience. The Buff Orpington is one that has been eulogized as having such properties in excess, but with my Dorking chickens of the same age they proved themselves no laggards in this respect, the five-toed true birds being ready nearly a fortnight in advance, while the color of the flesh and the fulness and plumpness of the breast made them a much more presentable table and market fowl. They had a fair trial, but being less than an improvement on the old stock the latter was found to be not only more profitable but far superior in other ways. Still as time wears on the pernicious advice is given that crossing the Dorking improves it as a table fowl, and the yellow-skinned, somewhat yellow-fleshed and fat Cornish Indian is the one yet unblushingly put forward as the breed tending to perfect that which already has no peer. Most breeders of the finest table fowls who have tried the blend have truly said that the yellowing of the chicken flesh and fat made them less salable than the Dorking pure and simple.

Another point noticeable is that the Dorking judges are now instructed to look for squareness of form more than the elongated absurdity that was at one time considered to be a better table fowl, when, in reality, it was a worse, for certain it is that a broad, deep breast is far better than a

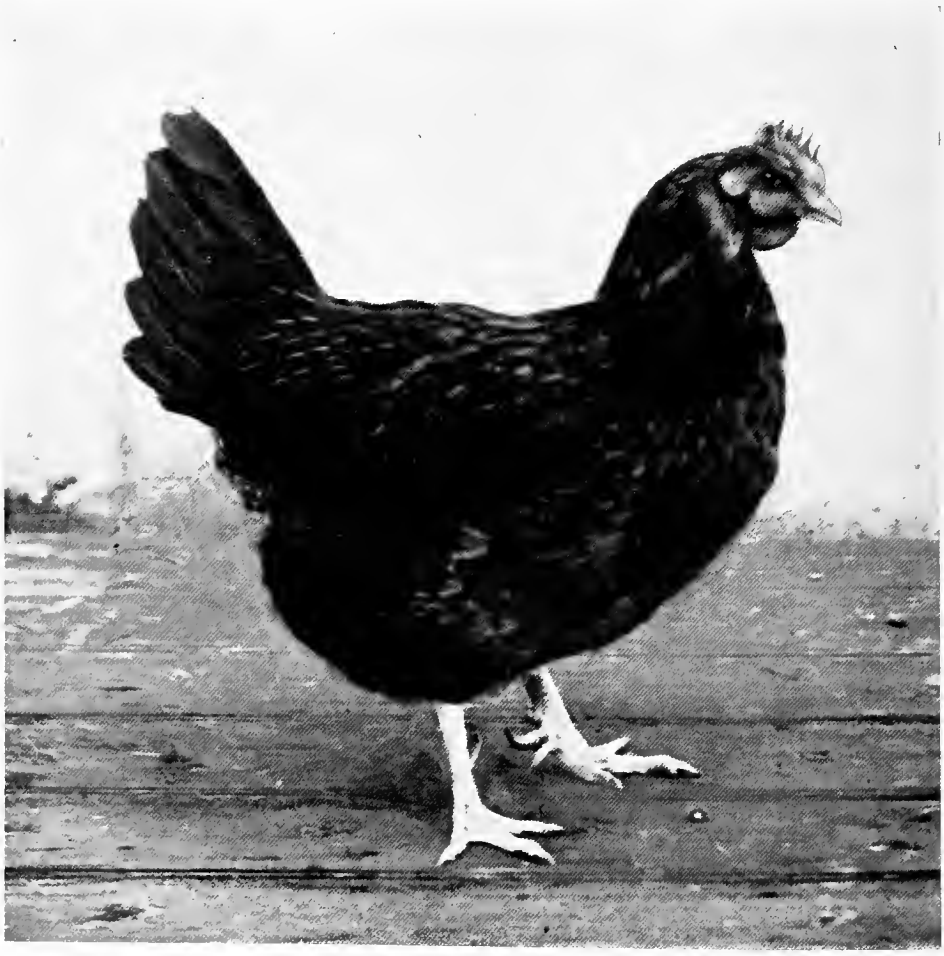
PRIZE DORKING COCKEREL

Dairy Show, 1895

longer one, the end portion being so shallow as to be dry in fiber and generally fatless. Again, it must be clear to the reflective and reasoning mind that as the whole of the breast flesh consists of muscular development necessary to move the wings, therefore that quantity of power must be better when placed in the front part of the fowl, and if so it is thicker, also more juicy, richer, and flavory than when the breast cut is long, narrow, and thus dryer. Nature always provides that which is the best, and the short, square-made form, like that of the breast of the grouse, is infinitely superior to any out-lengthened and unnatural formation. A really good Dorking should be heart-shaped, like the old English Game, and any divergence from such is a loss, or at least by no means a gain. A fowl to have a long and deep breast is a physical impossibility, though there are those ignorant of Nature's laws who yet advocate such as having more flesh than the square-made bird, irrespective of the fact that the strong, short-winged, quick-flying birds ever have the greatest chest muscular development. Besides which, experience teaches that long-bodied fowls have generally the weaker constitutions; therefore to advocate such shows a want of knowledge, due consideration and understanding of Nature's absolute laws and requirements, which by themselves produce a desired form of the greatest utility value.

Of the general show Dorkings, the silver-gray has decidedly advanced in quality to what it was some twenty years ago, when sooty shanks and feet were awarded prizes as though they were worthy of them, while their owners grew irate when told of the impurity of their stock. Such birds would now be unnoticed by the judges, and deservedly so. Therefore it is gratifying to find almost the whole class not only fine in form and color, but with shanks, feet, and toe-nails of the old ancestral white. Opinions differ on the subject, but it is none the less right that the silver-gray Dorking hen, like that of the silver-gray old English Game, should not have any other color but black, gray, and white, and the presence of buff or salmon color on the throat and chest denotes that it is the hen to the custard duckwing cock. Silver is a pure, light, steel-gray, or, more properly, the tint of that metal; any other color whatever, therefore, displaces the pureness of tone and it is no longer silver. It is this preference by some for the salmon breast on the silver hens that destroys the vivid brightness of the ground color. This is so whether the majority of the silver-gray fanciers think so or not, and one is generally met by the assertion, "Well,

I like to see a salmon throat," instead of carefully considered argument. Thus it is that the silver cock is one color and the salmon-throated hen decidedly of another. My own Gray Dorkings are pure grays, without the slightest tint of any other color but black, gray, and white. This being so, if a hen with a salmon throat is put among them the difference in the tone of the gray is at once apparent, and the gray shows the want of blueness that is present in the white-throated spangled grays. Another noticeable fact is that the silver-gray Gray Dorking of 1902 is more com-



From a photograph

PRIZE DARK DORKING HEN

Owned and bred by Herbert Reeves

pact, and the feathering is closer and of moderate length, which was not so twenty-five to thirty years ago, at which time the yellow-shanked Brahma cross was conspicuous by the coarser bone and longer, looser feathers; and the consequence of the Asiatic blood was proved by the sooty shanks and feet and dark or yellow-tinted toe-nails. Happily these are of the past or nearly so, and it is to be believed that the Silver-gray Dorking fancier is doing his best to make and maintain not only a beautiful breed of poultry, but one as near perfection as it is possible that the forces ever present in Nature will admit of. The breed of to-day is in far better hands than it was at the time mentioned, and faults are called by their right name—defects, and not smoothed as "blemishes" only, and the mongrelized Dorking called good and valuable because it was—big.

Now as to the Dark Dorkings of 1902, not nearly so much can be advanced in their favor as "the silvers"; they are decidedly more ungainly and clumsy both in progression and their general habits. In form there is a sort of rambling line that is neither graceful nor pleasing; also there is a looseness of feathering, which is of abnormal length; they are more bony and heavily made, and in all ways coarser, with a decidedly sour expression about the head; even the texture and spiking of their over-large combs is rough and granulated by comparison with the lighter, brighter breed. Nor does careful examination of the flesh fiber when prepared for the table give any points in their favor. There is nothing, perhaps, that makes faults of contour more clearly visible than "the camera." Photograph the two breeds and place the results side by side and the difference can be easily yet perfectly noted. The two are said to be Dorkings, yet devoid of their feathers the difference is wide, the dark generally being of the ugly, reprehensible, elongated form, while the silver is shorter, thicker, and has a plumpness of breast that is generally absent in the former. Why is this? for undoubtedly it is so. The reason is that it has been more mongrelized by Asiatic and other alliances to gain size at the expense of quality, and which is still unmistakably shown by the dark toe-nails and soot-tinged feet. Still it is a grand fowl, and by some considered handsome, but, as said before, in such, as in many other poultry matters, tastes differ.

The neglect of these charming varieties of our poultry is the more inexplicable when so many new-made breeds are sought and extolled for their alleged high qualities and gay coloring. There is no way of accounting for this other than that novelty seems for the time to possess

more attraction than proved sterling merit. The Buff Dorking has long been put aside, though the form is superior in most ways, and undeniably so as a table fowl. (The Dorking breeds that have been before the American fanciers' public are the white-colored and silver-gray, with an occasional "cuckoo" marked (Dominique plumaged) specimen.)

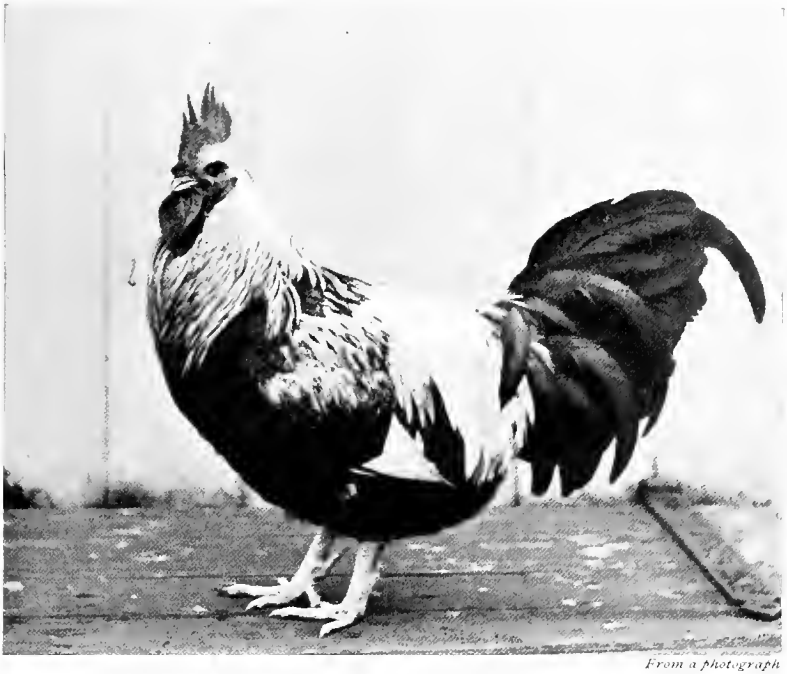
The craze of to-day is for bone and size; and the very cause and reason of the establishment of poultry shows—that of purity of breed and superior quality to be the first consideration—is scornfully derided, coarse and clumsy bigness being more prized by the semifancier, half-commercial judge of to-day. As long as this is so, the best and most desirable table fowl can scarcely hope to hold with the public, fanciers, or farmers that estimation that it most justly and incontestably is rightly entitled to.

A fowl to be good for culinary purposes must not only be of good form and fleshy, but one that will fat not only readily but evenly, and more particularly on the breast. It has already been observed that where the feathers are longest there are tracts of fat formation; thus it is that the back is well covered, and generally much accumulation about the lower part of the neck. The Dark Dorking, being particularly long in feathers, fattens more readily on these parts than the silver-grays; but this latter is by no means deficient, while the former would be greatly improved by the flesh being of finer fiber or tissue, and this to a certainty by a judicious cross with the old English white-shanked Game-cock, the hens being two years of age and the Game a stag. This cross has so often been used with excellent effect that with gourmands it is greatly in request, though of course it is not so perfect a fowl as the true-bred old English Game. One of the worst crosses in my opinion is that with the Cornish Indian, for the reason that it not only does not fatten so well on the breast, but frequently the whole body is stained with a golden yellow, which renders it perfectly unsightly and unsalable as a boiling fowl. (In many places in the United States dressed fowls of the yellow color are preferred.)

Therefore it is more desirable for general purposes to keep the Silver-gray than the Dark Dorking, especially so if exhibiting is contemplated; but if not, and prize-winning is uncared for, but beauty and utility the first object, then the black-breasted silver-spangled, the black-breasted reds, and the old gray black-spangled will at all times not only give pleasure, but add a most enjoyable charm to the home surroundings; also the white

with thin double or rose-form coral red combs must not be forgotten, nor, by way of variety, the cuckoos and cuckoo white spangles.

The Dorkings or old Kent, Sussex, and Surrey five-toed fowls are



From a photograph

DARK DORKING COCKEREL
The winner of many prizes. Owned by Herbert Reeves

said to be tender and difficult to rear; this is distinctly untrue. Had they been so, they would not have held their own as our farm poultry for hundreds of years, and then were the very best of fowls. My own (old grays, black-spangled) are kept on a somewhat low-lying meadow, with a retentive clay subsoil, yet the chickens thrive, grow quickly, and are out and about in all weathers, seldom or ever roosting in the house; but, whether wind, rain or snow, they are more often resting on the outside of their house in a row along the top ridge.

They lay as well as most of the poultry kept in the neighborhood, and in some instances better, often helping to fill the egg basket when there is both frost and snow. For table the Dorking is unequaled. Other breeds, because they are new and eulogized far beyond their deserts, have become prime favorites with the many in consequence; but as the fowl

is good, right, and proper for the English homestead, there is, take it for all in all, nothing to equal our old, pure-bred, white-shanked, five-toed native beauties.

The White Dorkings

In the article on "Poultry," in Rees's "Cyclopædia," 1819, it is stated that "The Darking [Dorking] fowls are all raised in the Weald of Sussex, but the finest market for them is Horsham, the five-clawed of them being considered the best sort; this, however, may be a mistake,* and it took its origin with some of this peculiarity that happened to be very large and fine, which laid the foundation of what has since been called the Darking or five-toed fowls, and considered in other parts of England as prime stock; but such a thing is hardly known in Sussex—it is a bastard breed."

This is strange reading after all that has been quoted from the old writers as to our poultry having five toes, and shows clearly how little trouble was taken to verify the statements respecting "our poultry." To my certain knowledge the fifth claw was prized and noted as the best to keep, both in Kent and Sussex, long into the last century; for when young I have heard this variety spoken of by very old people as "the true," and their own breed; also the whites were by no means uncommon. Then the writer of the above said, and most likely very truly, that "the Darking are all raised in the Weald of Sussex."

Mr. B. P. Brent, writing in the *Poultry Chronicle*, Vol. I., page 595, insists that the White Dorking is a distinct breed from any other fowl, and that it must have a rose comb, and that no other is true bred. He then describes the fowl as he knew it: "Comb rose, square-shaped, and evenly sprigged and terminated in a single point behind, and not falling on either side; gills and wattles moderate; ear-lobes whitish (moldy); beak, shanks and toes white; shanks short; toes five in number, the hind ones being double, well-defined, and raised slightly on the shank; plumage spotless white; neck short and full; wings and tail ample; back broad, stout across the loins; breast full and large, and the nearer the body approaches a parallelogram the better.

"The White Dorking is an excellent farmyard fowl, being a good layer, a close sitter, and an attentive mother; the chickens grow rapidly, and

*The mistake lies with the writer. The five-toed fowls have been noted as a breed for any number of years, and so kept and described, as old books and records prove.

PRIZE ROUEN DRAKE AND DUCK.

The property of the late Mr. J. PARTINGTON.

From a photograph

PRIZE DARK DORKING HEN
Owned and bred by Herbert Reeves

are most excellent on the table. The pure White Dorking may also be considered as fancy as well as useful, because they will breed true to their points."

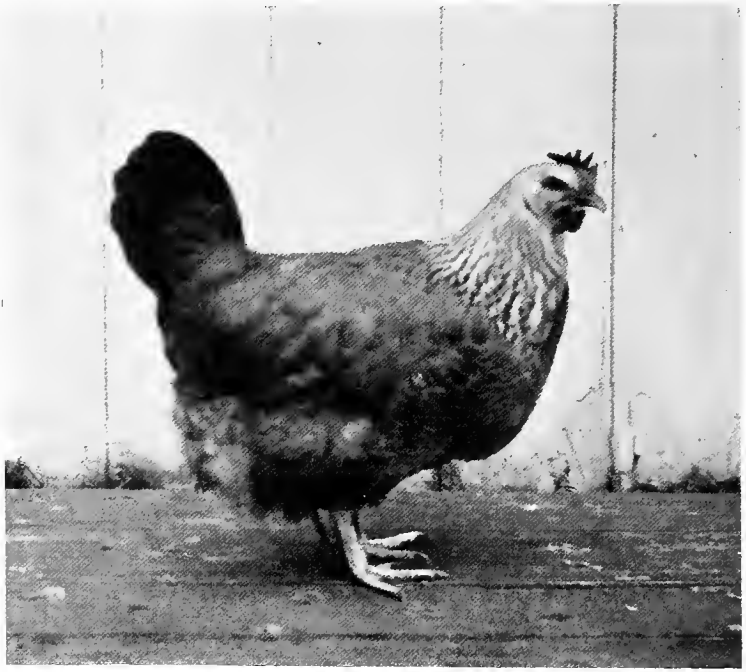
This is what the White Dorking was in 1852–53. Mr. Brent has given a fairly accurate description not only of what it was, but what it should be; still it cannot be conceded, after what has been said as to the origin of Dorking fowls, that it is "a distinct breed" from that of the Kent, Sussex, and Surrey fowls, or does not derive its existence either from these or Roman importation. There is no doubt that there was a white

breed of fowls kept there or thereabouts, but to say that they were of a different ancestry from our others of a similar form is, in my opinion, advancing too much, and is in some degrees contradicted by the various statements already quoted, particularly those of Mowbray (John Lawrence). Moreover, there were from time immemorial white fowls in Kent, etc., with rose or single combs; and many of the old writers, after describing the five-toed fowls of the period, warn their readers against having white as being of less worth, etc.

Not a few of the old Kent and Sussex farmers were proud of their breed of white fowls, and even ducks. The former mostly had a rose comb, as indeed did many of the colored, but they generally were not in favor, and the old single comb was preferred.

Colors of the Dorkings

Of these there is not much to be said, for the reason that they mostly follow those of the old English Game already enumerated and described;



From a photograph

PRIZE SILVER-GRAY DORKING HEN
Owned by Herbert Reeves

but perhaps it would be better to give a few notes regarding them; the Dorking or southern fowl being, as it is, one of our oldest and the best of European breeds.

The White.—This should be a clear dead white, without the slightest tint of yellow or any other color. Some prefer the eye to be pearl in color. I do.

The Gray.—In color this is like the old black-breasted or gray-breasted Game-fowl. Dark-gray breasts were allowable in the cock when heavily streaked with black; these have no black wing-bar, but a black lacing of the wing coverts. The hens are gray, with black tips to their feathers, which should have white mid-ribs and shafts, white and gray on the upper part of their breasts.

Dark Gray.—These resemble the black-breasted birchen grays, with a black wing-bar. Hens gray with dark tip to their body feathers, breasts white with the feathers gray to dark edging, with white mid-rib.

Reds.—Cocks, black-breasted reds, with large full tails, mostly black with emerald sheen. The hens deep, bright-chestnut red, with black tips to their body feathers, hackles dark-purple black, wing primaries and secondaries black on inside web, red on outside web, the shaft and mid-rib of the body feathers a light bright-yellow or orange.

Brown.—The cock the same as the foregoing, but of deep brown or rich bright ruddy tints, with dark chestnut-colored breast. Hens brown partridge, upper part of breast a reddish-brown, with dark tips to feathers, with white mid-ribs.

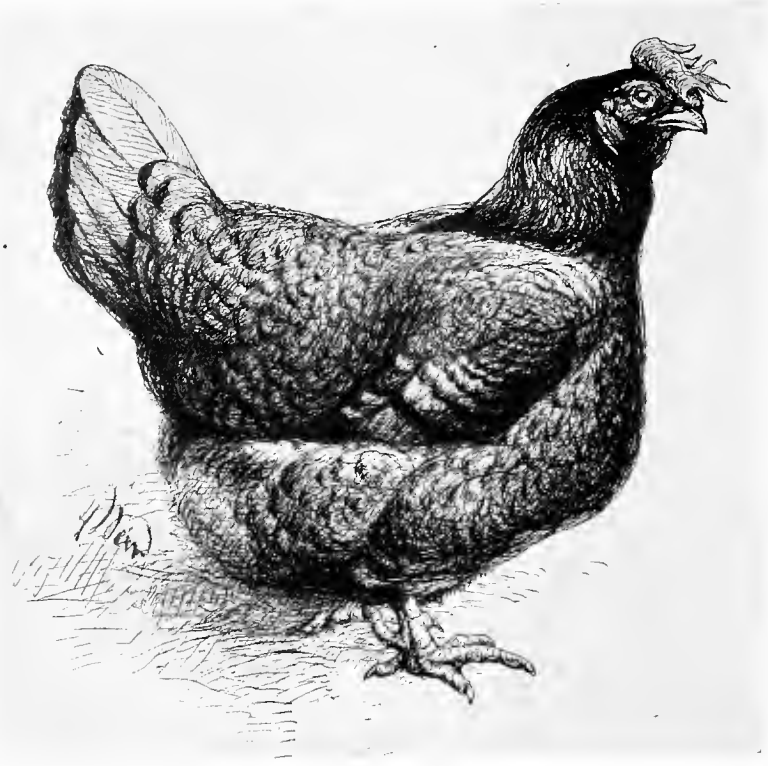
Darks.—The cock black-breasted, with black tail and wing-bar; the hackle, back, saddle, and wing bow a light gray, with a tint of black down the center of the hackle feathers. The hen to be a glossy black with the exception of the throat and breast, which should be a rich gray, slightly laced with a dark color.

Spangles.—The same in coloring as the old English Game. Each feather tipped with white; but if black spangles, then black.

Speckles.—These are the same as the old English Game spangles. If a red speckle, each feather should be tipped with white, and so if a black and gray speckled. These, when good, have a very fine, rich, bright appearance, a flock of the reds and blacks being as bright as a tulip bed. Any pure white feathers in this or the foregoing should disqualify.

Cuckoo.—A well-known color of a light gray ground transversely striped with a darker gray. There are also brown and golden cuckoos.

Barred and Spangles.—Cock white, black spotted on the breast, black wing primary and secondary, wing feathers black or inner webs white outside; hackle, back, saddle, and wing-bow ticked with round black spots. Hen white, spotted, or barred with black throughout; tail black. There is, or was, another variety of these in which the ground



BRIGHT RED AND BLACK-SPANGLED DORKING HEN

was orange, the marking the same; these were called the old Kent barred spangles. Another variety was laced instead of being spotted with black.

Very Light Grays.—These were nearly white, with full rich black markings on the hackles and the wing primaries and secondaries black on inner webs; tails black, in point of colors resembling what are now called Light Brahmas.

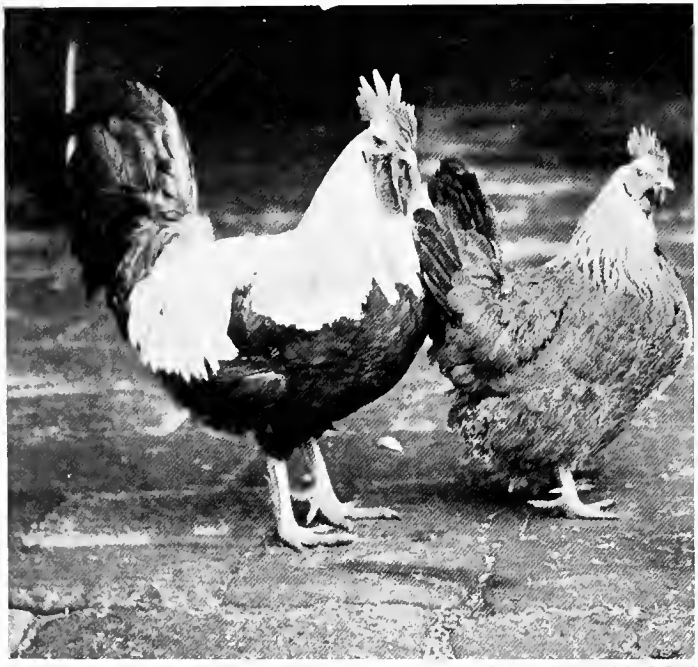
There are many with moderate colors, as in the old English Game. In all, the shanks and feet were white, combs double or single, wattles

red, deaf ear pinkish-white or white-edged pink, as though (and possibly) weather-stained.

Here is an excerpt from Varro, translated by the Reverend J. Owen, M.A., 1800, page 223, giving a description of the farmyard cock of about two thousand years ago, with form and color, etc. It appears the red were thought the best, for he says those "who wish to have a perfect poultry yard are to choose the villatic hens chiefly, in procuring which they must select such as are the most prolific, generally with red plumage, black pinions, unequal claws, large heads, erect large crest, for these are better qualified for breeding. They must choose the cocks that are muscular, with a red crest, a short, full-pointed beak, gray or black eyes, bright-colored red wattles, a variegated gold-colored neck, the inside of the thighs hairy, short legs, long claws, large tail, close pinions, which are also erect, and crow often." Here is a description of the then red, five-toed fowl. One peculiarity mentioned is, thighs hairy. This is an almost exact description of the old Kent and Sussex fowls, and goes far to prove that they were an ancient and pure race, and most probably, as before stated, brought to this country by the Romans; for not only were many of our five-toed southern poultry of this form and color, but they had also the long hairs on their legs and thighs. Among my own old Kents, many, both cocks and hens, had coarse hairs nearly two inches long on their thighs, and some few an inch or so more. On pointing out this peculiarity to my man (a man of Kent), he said that it was nothing uncommon, and that years ago most of the cocks about were more so. Is not this some proof of the antiquity of the five-toed Kent breed?

By way of conclusion, I will call attention to the peculiar coloring of the old Kent and Sussex five-toed breed. In the first place, they varied in this exceedingly, being bred chiefly to the fancy of the owner, and in certain localities. Though some varieties were much more scarce than others, perhaps the white with nearly black penciled hackles, wing primaries, secondaries, and black tail were the most uncommon. A near relative of mine had three or four flocks of these. Possibly it may not have been noticed by other fanciers that this is a colored form of the albino, and exists in many animals as well as birds. The East Indian rabbit is white with black ears, tail, and legs, and has pink eyes. The Siamese cat is the same. There are Guinea-pigs so marked, and the Chillingham cattle,

besides others. Therefore, being as it were a freak of Nature, it ought not to be difficult to perpetuate, mostly coming true. But in these fowls there is the peculiarity of the white mid-rib or shaft of the feathers; no matter the colors, this in the pure breed remains white or nearly so, and with the richer tints produces a most brilliant effect; and there is another difference, namely, that generally the feathers are tipped with black or a black color on almost any kind of ground. Thus in the red the hens are black spangled, so in the browns, the grays, light or dark, and others; and often this is so in all shades; but when the black tip is changed to white, this then is the speckled or white spangled one of the many colors for which the old Kent, Sussex, and Surreys were fancied. If crossed out, as the silver-gray is an example, then a mossy smooth appearance is often the result, but even colors are the exception and not the rule, and are not typical of the race.



From a photograph by C. Reid

SILVER-GRAY DORKINGS

At the present time it may be justly said that no one has a truer stock of the White Dorking, or one that has endeavored by all legitimate means to uphold the breed and to restore it to its original purity, than that highly respected fancier, O. E. Cresswell, Esq., J.P., of Morney Cross, Hereford.

Mr. Cresswell began keeping the breed in 1868, with chickens hatched

from eggs that he got from Mr. B. P. Brent, then, as he says, residing in Sussex (but later of Bessels Green, near Sevenoaks), well known by his excellent book on pigeons and his various articles on poultry; he was also a good naturalist. These chickens were the foundation of Mr. Cresswell's well-known and highly successful strain. Of these he says in the *Feathered World*, January 9, 1900: "My original Sussex birds were, as far as I can recollect, very pretty and pure white; but they were by no means massive enough nor deep enough in the breast to be first-class table birds, and nowadays would stand no chance in a show-pen. I have always suspected that they had some slight taint of White Game blood, for single combs were common among their immediate produce, and the hens laid pale-pink eggs, as did many of their descendants for several generations." I quote this for more than one reason; firstly, because the old and original breed of white Dorkings consists of strains with both rose and single combs; also there were rose and single combs among the colored varieties.

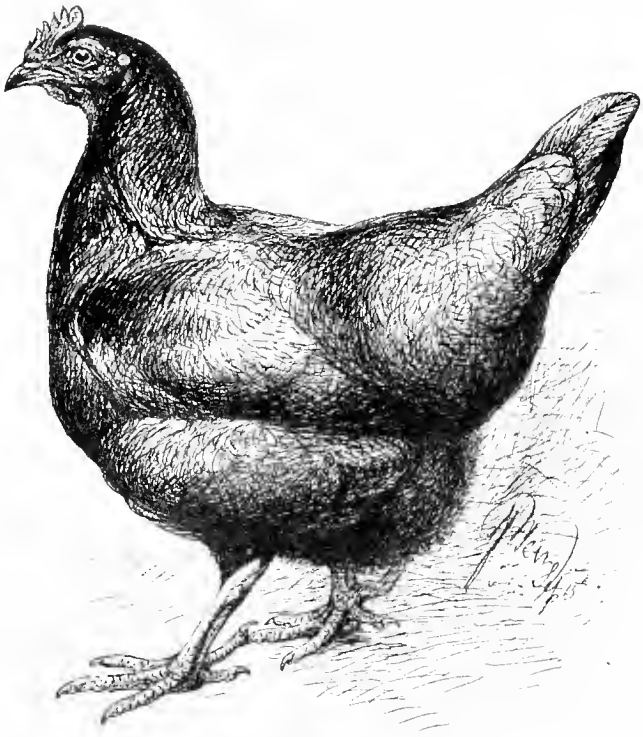
From a photograph by C. Reid
SILVER-GRAY DORKING HEN

Other White Dorking fanciers have contributed largely toward the refinement of the breed besides Mr. Cresswell; but none, or few, have so well succeeded in returning to the old type. A few years ago Mr. Joseph Pettipher showed some exceedingly nice birds of high commendable form of character, but he does not seem to have kept pace with Mr. Cresswell; and the White Dorking Club has rendered lasting service, though it does not appear to be aware of all the points and excellences of the old breed. I can fully realize, and know how often it is said, that elderly people think there is nothing like or equal to the past, and that such assertions are merely that and are not borne out by facts; but in this case at least the statements can be well substantiated, for there is the drawing

of my white cockerel in the 1853 edition of the "Poultry Book," and which gives an original drawing, with that of a pullet made at the same time, and which in character and form, fleshiness and quality, is, I maintain, unsurpassed by any of his age at the present time. The cock had a single comb, that being my preference, as well as many others at the time. If I had preferred a thicker and more clumsily made bird, it could have been bred easily from the same stock by feeding the hens on more forcing food. This bird was heavy for his age—nearly ten months—and with full, rounded breast; the deep form, as to keel, does not carry any more than the moderate, while according to the size of the wings and their frequent use is the sternum thickly covered with pectoral muscles. The bird weighed about ten pounds at the time he was selected by the editors of the "Poultry Book" as one typical of the breed.

Here it would be well to call attention to a curious fact that has escaped the notice of the numerous writers on poultry, especially those who call themselves experienced and practical; namely, that before the time of the shows all farmyard and other poultry was considered, for table purposes, to be at its prime in its first year, and stags, as cocks, the best for breeding in the January and February of their second year. Early hatched pullets of the previous years that had laid in the autumn were good also, but none after the spring of the third year for breeding stock. It was always a young stag to an older pullet or third-year hen which kept up the freshness and vigor of the strain. Well, this being so, when the Zoölogical Society of London held their first exhibition, all shown were young birds—fowls, ducks, and geese. The second show was the same, the poultrymen believing their birds to be at that time at their very best, both for winning and selling. And so it was in selecting types of breeds for illustrating the "Poultry Book"; all, with very few exceptions, were birds of the year. Any one having the 1853 edition can easily arrive at the truth of this statement by examining the shanks and the bud-like spurs of the cockerels and pullets. Mr. Sturgeon's cockerel Shanghai was under ten months, so were Mr. Balance's Malay, Mr. Gilbert's yellow Shanghais, Mr. Sturgeon's cinnamon pullet, Captain Hornby's Game and his colored Dorking, my own White Dorking cockerel, and all the rest, with the exception of Mr. Sturgeon's buff Shanghai "Queen," which was in her second year. I am able to certify such as a fact, for I painted, handled, and examined them all. Possibly this has made

much confusion of ideas as to what our poultry was at that date. The poultrymen of the present, comparing their old birds with the chicken pictures of the past, are rather more than apt to sit down in an elated state of self-glorification, and to plume themselves into the belief as to the variations of the breed of to-day being "progress." This showing of young birds was the general practice for some time, until old and young classes were formed, and the boasted weights of the older began to tell seriously against the younger, when all sorts of crosses were resorted to to get size, however rough in character, and this was naively termed "early maturity." So it is that nearly all the illustrations made of the shows at the Zoölogical Society, those at Birmingham, London, etc., are portraits of young birds; therefore those in the "Poultry Book" must be regarded as such for comparison. And thus it is that such a number of "ready writers" commit somewhat serious blunders in their description of "the past and present"; and not the least pretentious of them, as to knowledge, are those who, having perhaps bought a few birds or a stock or pen of some noted winners and breeds, show and win with them, not their own raising, and then claim knowledge that they really do not possess,



DORKING AND LANGSHAN HEN

though generally ever ready to inform and opinionize on every quality and detail.

Breeding Old Kent, Sussex, and Surrey Fowls

It has been urged against the old Kent and Sussex five-toed fowls, times and often, that they deteriorate in size and color, and some come with four toes only. If true bred, the latter is never the case, as I know by experience; nor do they deteriorate in size or vary in color if rightly managed, as they were on our farms seventy to a hundred years ago, and probably more.

While admiring Captain Hornby's Dorkings in 1852–53, he told me that they bred as true as "Game" in color. But he afterward made a contrary statement in the *Poultry Press*, and said that some came four-toed, though they were pure bred. How could this be, when "the silvers" were got by crossing with Lord Hill's silver-gray Game-fowls, and these were interbred with the darker kinds? It was stated by others who kept the so-called Dorkings, and believed as correct, though this breed of fowls was bred by the Kent and Sussex farmers as true as any other race of fowls, and that while the modern fancier mostly failed, not from the mere

ROSE-COMBED WHITE DORKINGS

non-purity of the breed, but from an absolute want of knowledge of the right way to obtain success; and thus, from such lack on their part, to shelter themselves, they said it could not be done, and this with plenty of flocks of uniform colors still in and about the old southern homesteads. How was it done? Why, on the same principle as the best Game-fowls were bred—"youth to youth." Mr. Edward Hewitt, in the *Cottage Gardener*, 1857, page 223, adverts to it, when to the question, "Could you favor me with the cause why the chickens I now breed are so infinitely inferior to those I obtained a year or two back from the same old birds?" he answers, "I am confirmed in this opinion, by oft-repeated trials, that the gradual decline of individual constitution in the size of such poultry tends incredibly to produce such results; that while the most uncared-for fold-yards of our agriculturists are free from such calamity, the infinitely more highly esteemed flocks of our amateurs, who let no expense deter them from adopting every available advantage, are constantly the subject of this most vexatious discomfiture." Here I must join issue with Mr. Hewitt when he says "the most uncared-for fold-yards of our agriculturists." If this were so, the result would not be what he claims for it. The farm poultry were cared for and bred on certain principles, and they the most ancient—that is, the selection of the largest and best. After noting "natural selection," etc., he further says: "We continually find instances in our fold-yards where a cock that has maintained inviolate his supremacy one full season has the next spring been subjected to maltreatment and oppression from a stronger and a younger bird, his own former victim; thus treated, he becomes 'a changed bird,' literally 'henpecked.'" This would be so, doubtless; but it was not the practice to keep such cocks until the third year, but to rear the largest, strongest, the most vigorous "stags" or second-year cocks, and these were changed every year; and indeed to such an extent was the custom carried that it became proverbial—

"Never keep a cock nor a servant more than a year." *

And the hens bred from were in their third year, seldom the second year (or pullet hens, as they were called), unless they were unusually large, "roomy," and forward; and all were chosen for bulk, health, and quality, especially so when the stock was "inbred" or a "cockerel or two" was

* A variant is, "A cock and a servant are good but a year."

got in exchange from neighboring farmsteads. Thus it was that the poultry of certain farms and locations became of an even coloring and character, and, as is admitted by Mr. Hewitt, the method was successful, while that of the fancier was a failure. But further, from his remarks: "The truth can be soon told. Amateurs are directly prone to two equally ill-advised practices. First, if a male bird has been able to gain high position at poultry shows, combined perchance with the production of extraordinary chickens, he is retained long beyond the time it was advisable to keep him as 'a stock bird.' The other error is equally mischievous. From possessing some much-desired peculiarity of feathering, a cockerel is most unwisely selected, puny, and without constitution. . . I am confident when any race of poultry has arrived at all the required features fancy dictates as the uncompromising rule of absolute perfection" (and they certainly are acquired by long-continued attention to careful mating of the parent birds), "progress itself is not more unattainable than the perpetuity in all respects of the 'points' so long coveted. They must, in this case, be crossed with strange blood, or they will infallibly breed out altogether." With this I disagree, as I have known the same strain to be not only maintained in perfect health and size by proper selection and judicious management, but have also known the work of many years destroyed by the crossing-out with "strange blood"—it has generally proved to have the most disastrous effects, and was seldom or ever resorted to by the "henwife" of the best poultry on the Kent, Sussex, and Surrey farms; and yet, as Mr. Hewitt has admitted, "they" (the farmers) bred successfully. But further, he says: "A friend of mine purchased some unexceptionable gray Dorkings. For three years the produce was equally large with the parent birds, and true likewise to a feather as to general coloring." (This might be expected if the parents were of the right stock, but would probably be the limit as to age for breeding strong, vigorous birds, and the sequel proves this, as it has done in very many cases before and since then.) "The chickens the next two years 'sported all colors' and in size degenerated exceedingly, no additional brood stock having been obtained in the interim." (Nor would there have been need had the old southern plan of breeding a fresh young cock (stag) been resorted to; and these fanciers were those that published the erroneous statements that the Dorkings could not be bred true, when it was their own ignorance of the natural way and proper

OLD KENT WHITE GROUP

methods that brought about the deterioration.) But further of Mr. Hewitt: "To the old hens, a son of one, bred two years previously, was repurchased and turned down in lieu of his own male parent; every chicken produced to him was equally good in color, as they had formerly been in the youthful days of his sire, but did not attain so good a size." Here it should be observed that there was no change of blood, but close "inbreeding"; and yet the value of youth and vigor was demonstrated by the fact of the cock giving color, as it is said to do, while the hens being old the size was not again increased; had they been sisters of his own age the result would most likely have been entirely satisfactory. But further, "At four years old this latter bird produced chickens of 'all colors,' and was this spring removed to make way for a younger

one, a cockerel of last year. This last bird's chickens, so far as can yet be seen, are true silver-grays without any spangling in the breast, or indeed any deterioration of color." He adds, "To me I admit it is strange, though true, that such want of general uniformity of plumage should accrue simply from age in the male bird; but of this I am equally aware, that an excessively old cock Sebright Bantam invariably begets chickens with most imperfect 'lacings,' though himself strongly marked on his own plumage, while no such imperfection is general from long life on the hen's side. From what I have advanced, I think it is pretty apparent that the most vigorous cockerels should always be the selected ones for 'breeding,' even where it is still considered desirable to retain an especial good old cock simply for exhibition; it will prevent many troubles." I have quoted Mr. Hewitt because he was recognized at the time (1857) as an old, true, and ardent poultry fancier, and one whose opinion was valued; and yet, probably, like most, if not all, of the fanciers of the period, he was unacquainted with the natural forces always present, not only in the breeding of poultry, but of other domestic animals, that was a traditional knowledge of the Kent, Sussex, and Surrey farmers for many generations.

SUNNING

SOME SCOTCH FOWLS*

"The true friend is to be more esteemed than kinsfolk."—CICERO.

DANIEL, in his "Rural Sports," 1813, under the heading of Roxburghshire, writes: "Poultry, in this district, are reared in vast quantities, and several cartloads of the eggs of dunghill fowls are annually collected by egglers, who sell them in Berwick for the London market. A certain practice to make hens lay plenty of eggs is to feed them frequently with boiled potatoes and a small portion of oatmeal, a little heated; in winter, to forward the same purpose, the hens are kept in as dry and warm a place in the house as possible; in cottages, they generally, during the night, sit at no great distance from the fireplace; the consequence is that farmers whose poultry are in the night-time confined in places without a fire obtain no eggs; the poor people have them in abundance."

As far back as 1862–64 I spent much time in Dumfriesshire, grouse-shooting, etc., and can therefore bear testimony that about Moffat and on the hills the cotters still acted on the same plan. In many cases the byre for the cow was also a part of "the hoose," and the fowls would come in and sit near the fire, or walk about the table at the meal times; even a hen and chickens found a warm corner for the night, undisturbed. The eggs were collected and brought in by barelegged lads or lasses, who often came long distances ow're the hills, carrying a basket of eggs and—their shoes.

But few old birds were kept at the shanties, seldom more than five or six hens and a cock, and in the early morning these would roam away some distance, mostly to the damper or moist part of the hills, in search of insects, etc., but they were sure to be back at feeding time, which was about 10 A.M., as a shepherd told me was the right time, as the grouse fed then or a little before; and, said he, "Nature is Nature, and if ye'll do weel ye mon abide by Nature. Besides," he added, "they been at it

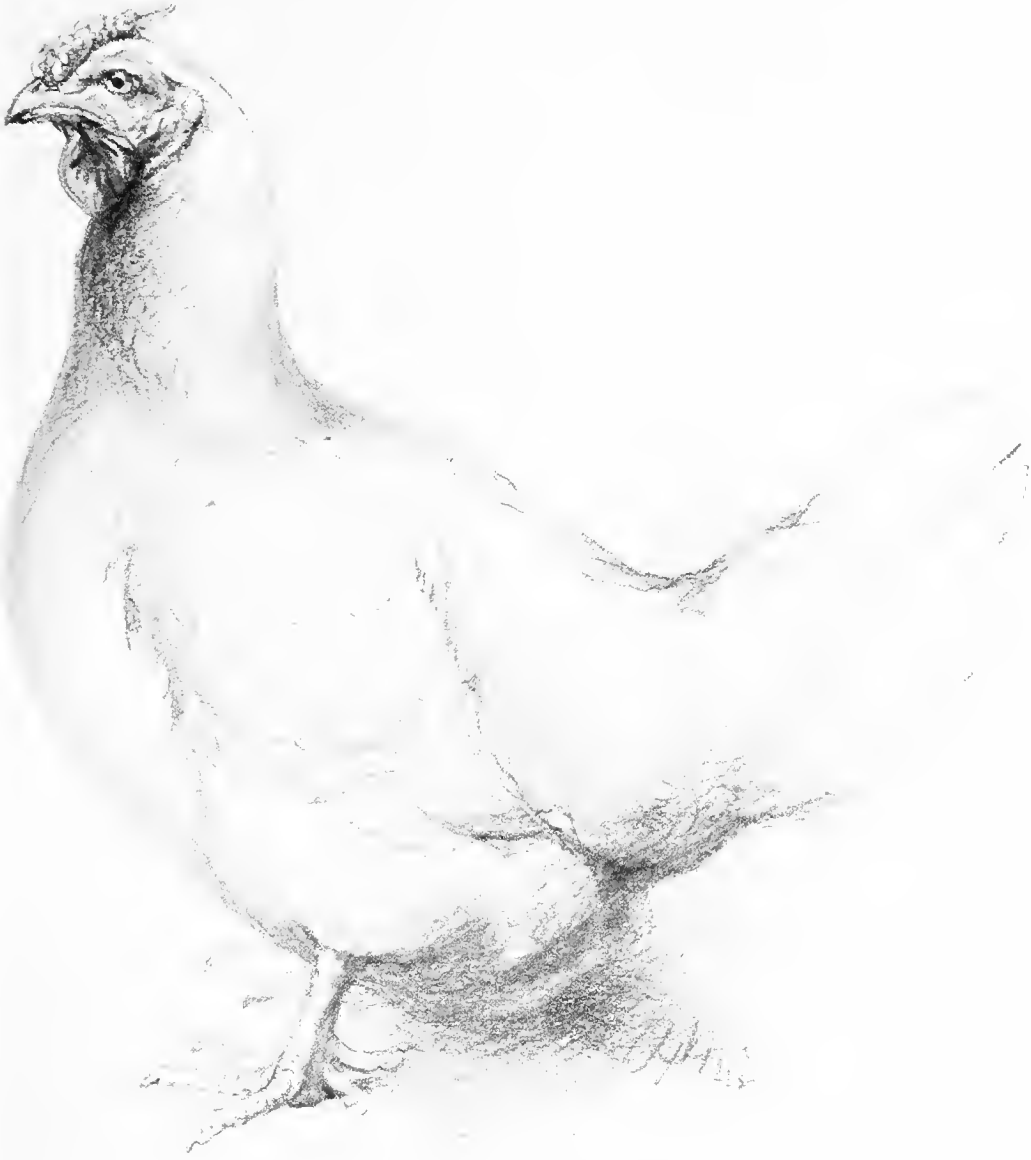
* This chapter is substantially as it was printed in the English edition.—EDITOR.

all the morn, and noo they'll sleep a' the sun awheel," and then in a lower tone, "like thee grous."

The fowls then kept "there and thereabouts" were quite the old sort—square, plump, short in leg and thigh, with medium length of shank, the heads rather large for the size of the body, with upright combs on the cock and a drooping one on the hens; the eyes were full and intelligent and dark or red; the ear-lobes white to a light pink, which last was, perhaps, but a weather tint; the shanks and beak were white; the carriage somewhat upright; large tails, full-feathered, and mostly of a dark gray or mottled black and white, seldom with red, but more often with straw color; the bodies of the hens were brown, or a gray brown with dark hackles, and the cocks had mottled gray and black breasts. The cuckoo grays, one old man told me, were called about there (out by St. Mary's Loch) Shepherd's Plaids; this, possibly, was mere "pleasantry," with a leaning toward the truth. All laid snow-white eggs of a somewhat oval form and good in flavor. As table fowls they were excellent, being extremely fleshy, and this very white and sapid, not being used to much grain food; when cooped or well fed they fattened quickly, and were then delicious eating. The same breed was kept at the "big hoos" where I was staying; and the fowls of Craiggieburn were for the table of the host; these were the old, old breed, and none else were kept about there at the time of my visit. Though not of the same color generally, they much resembled in form, but somewhat shorter in the body, the breed that is now to the front and called

The Scotch Grays

This is a very old breed, and, like the ordinary old Scotch fowl kept by farmers, keepers, and cotters, is particularly hardy. Though it is said to be distinct, it has always given me the impression that its origin lies almost, if not entirely, with the ancient dunghill breed of the country, with the exception that the true old Scotch Gray was a trifle more Gamey and upright in its carriage; but its habits were precisely the same as those I noted in Dumfriesshire round about Moffat, Loch of the Lowes, St. Mary's Loch and the adjacent hills, villages, and cotters' homes. Although there were grays among these, yet they were not looked on as anything beyond "the ordinary," nor were they sought for more than other colors. Still, in some districts, an attempt had been made to breed for form, flesh,



WHITE DORKING PRIZE HEN

and color; and over forty years ago, when at Kelso, I was shown some examples that showed not only careful breeding, but also an evenness in general appearance and utility that was highly favorable, and went far to prove that they were a good and true strain of an ancient and original type of fowl.

I give the standard as proposed by the Scotch Gray Club, 1885–86, with some of which it will be seen I am not in full accord, nor do I think that the bird of to-day possesses the numerous high qualities of that of forty to fifty years since, having, as it has, a mixture of foreign blood not observable in the old Scotch farm and cotters' breed.

General Characteristics

Cock

Comb.—Single, medium size, fine in texture, perfectly straight and upright and with well-defined serrations, bright red in color, free of side sprigs and come well down on the head behind.

Beak.—Strong, well curved, white in color, or white streaked with black.

Head.—Neat, long, and fine.

Eye.—Large, bright, and clear.

Ear-lobe.—Medium size, fine in texture, and bright red in color. (I say "white" emphatically.)

Wattle.—Medium length, bright red, well rounded on lower edge.

Neck.—Medium length, finely tapered, well arched, and having hackle flowing down on shoulders and back.

Breast.—Broad, deep, and full, and carried well forward and upward.

Body.—Medium length, compactly built, and full of substance.

Wings.—Medium size, carried well up, distinctly barred bow and tip, covered by hackle and saddle feathers.

Tail.—Medium size, carried well up and receding from body—not squirrel—with flowing sickles and secondaries nicely and evenly barred.

Thighs.—Long, straight, wide apart and strong; not quite so prominent as in Game.

Legs.—Strong and rather long, white in color, or white mottled with black; not sooty.

Feet.—Four-toed, straight, and strong; same color as legs; toes straight and well spread out.

Size.—The larger the better if combined with quality.

Shape.—Neither Dorking nor Game, but a blend of both—*i.e.*, having features allied to both.

Carriage and Appearance.—Erect, lively, active, bold, and graceful.

Plumage.—Cuckoo-feathered, grand color of body; thigh and wing feathers should be bluish-white, while that of hackle, saddle, and tail feathers may vary from bluish-white to light gray. The color of the barring must be glossy black with a metallic luster. The barring in body, thigh, and wing feathers should be straight across, while that on hackle, saddle, and tail may be slightly angled or V-shaped, and the alternating bands of black and white should be equal in width and proportioned to size of the feather. The bird should read throughout—*i.e.*, be the same shade from head to tail, and be free from red, black, white or yellow feathers; and the hackle, saddle, and tail should be distinctly and evenly barred, while the markings all over should be rather small, even, distinct, and sharply defined.

Hen

Comb.—Medium size, evenly serrated, either erect or falling slightly over.

Beak, Head, Eye, Ear-lobe, and Wattle.—Same as cock.

Neck.—Rather long; hackle distinctly marked and same shade as body.

Breast, Body, and Wings.—Same as cock.

Tail.—Medium size, well marked, receding from body; not squirrel.

Thighs.—Long, strong, and well shown.

Legs.—Rather long, pinky white or slightly mottled; not sooty.

Feet, Size, Shape, Carriage, and Appearance.—Same as cock.

Plumage.—Same as cock, but markings rather larger, even, and distinct, producing an appearance like a shepherd's tartan.

Points in Scotch Grays

Size, 5; comb and head, 3; tail, 3; color of plumage, 5; symmetry, 5; condition, 4. Total, 25 points.

Value of Defects in Judging Scotch Grays

Standard of Perfection.—A perfect bird in shape, style, color, condition, etc., to count 25 points.

Defects to be Deducted.—Bad comb and head, 3; bad shape and carriage of tail, 3; want of size, 5; want of symmetry, 5; want of condition, 4; faults of plumage, 5. Total, 25 points.

Disqualifications

Fraudulent dyeing and trimming, any bodily deformity, and distinct characteristic of any other breed not applicable to the Scotch Gray.

Scotch Bakies or Dumpies—Jumpers

Although aware of the existence of this breed in Scotland, I had never seen any until visiting Mr. John Fairlie, of Chevely Park, near Newmarket, in 1852–53. The flock consisted of some twenty-five or thirty, and all bore the stamp of being a separate and distinct breed from any other European fowls. In many ways they were particularly interesting, much so in their general habit and walk, which was sometimes diverted into a jump or hop; though not a series of hops like the progression of the sparrow, but simply one or two occasionally, then a short walk, and again possibly more jumps, according to any impulse or need they had for moving. After much careful observation and study of the cocks, hens, and some few chickens, I came to the conclusion that they were most likely a variant of the old English short-shanked fowl named "Grigs," mentioned by Rae in his edition of "Willoughby," 1678, and that being so short limbed they were probably found unsuitable for our English homesteads, and had thus become scarce. Although those of Mr. Fairlie came from Scotland, I could not learn of any others being there; and therefore there was no conclusive proof that they were by any means entirely a Scotch breed. Nor could this be considered at all likely, when taken in conjunction with the old English "Grigs"; though, at the same time, this being a mere surmise, it is not needful to suggest any alteration of the name by which they are known, or that there should be any prefix or addition to it, for though the resemblance by description is great, they may not be identical.

Besides making several pencil studies, I painted a cock and two hens for Mr. Fairlie. The birds of the whole flock throughout were very similar, the difference of form and color being very slight. This evenness of general character and appearance fully impressed me as demonstrating the pureness and possible antiquity of the breed. All were particularly healthy and strong on the wing, and if frightened they, being very timid,

would fly very rapidly some distance. Curiously, though short in their thighs, legs, and shanks, they were rather long in the body, or appeared to be so, yet were full and plump-breasted; the feathering, though somewhat long, was close and compact, the tails being large and well spread, the sickle feathers broad, curved, and lengthy, as were the large tail coverts; the neck hackle or plume and the saddle hackles were full and long. In color they were red and black, or yellow, gray and black, splashed with white, in some instances quite "gayly" so. The head was broad at the back and tapering toward the front; the comb medium size, single, upright, and deeply serrated or spiked; the wattles rather large, long, and pendulous;

CUCKOO BAKIES, OR JUMPERS
Owned by Mr. Weir

ear-lobes full and pinkish white or white; eyes light reddish-orange, though in some cases inclining to pearl or daw color; the crow of the cocks resembled that of the Game-fowl; the eggs were somewhat oval in shape and white; the hens were fairly good layers. The weight of the cocks was between seven and eight pounds; the hens, five and a half to six and a half pounds, or even more. The beak, shank, and feet were stout and strong; the shanks very short and all of a flesh-white; toe-nails white. The hens were good sitters and mothers; the chickens when very young were tender to rear, being susceptible to colds from damp; even when five or six weeks old a run in long grass was sometimes fatal.

As a breed they were particularly active, being fond of perching on trees, flying up with great agility. As table fowls they were said to be excellent, while for household pets their quaint odd appearance gave an attractiveness that was pleasurable.

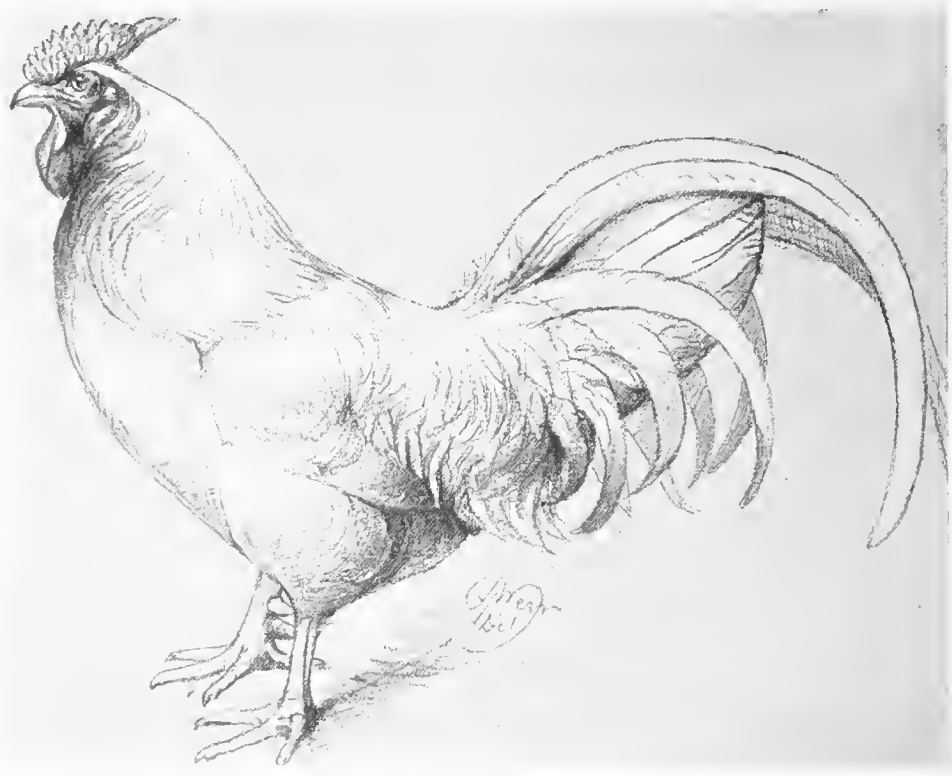
The Dumbartonshire Fowl

The following is a peculiarly interesting excerpt, taken from Daniels's "Rural Sports," 1813, Vol. III. Of Dumbarton it says:

"This county produces a variety of the dunghill fowl which has sometimes been found in the mosses and domesticated by taking the eggs from the wild birds and hatching and rearing them by a common hen. This variety is called the 'heath fowl,' and is but rarely found either here or in the northern counties of Scotland. It is not so large as the common sort, but the eggs for the most part are of the size of the duck's, and are very fine. The hen continues to produce eggs for a long time, and seldom inclines to hatch. When the eggs are hatched by another hen, care must be taken to burst the shell after it is chipped, it being frequently so hard that the young bird cannot disengage itself. The color of the chick very much resembles that of a partridge, but in fowls come to maturity it is commonly red or brown, mixed with spots of white or gray. Both male and female are round-crested, and often the tufts are so large as to hang over the eyes, and must frequently be clipped. They are smooth-legged, and the length of the leg is in proportion to the body. The heels of the cock are short, and not well adapted for fighting; yet both sexes fight keenly with the bill, which is thick, short, and crooked. Although fully tamed, yet they are fond of swamps and woods, and extremely greedy of worms and other reptiles, in quest of which they wander to a

considerable distance. They sometimes leave the dunghill fowls and, for the sake of insects, follow any plow that is going in the neighborhood. This breed is more easily supported than the common, and their eggs bring nearly double the price of those of ordinary fowls."

As this was written as far back as 1812–13, it seems curious that in these times, when every variety of fowl, worthy or unworthy of notice, is being hunted up and lauded, rightly or wrongly, that this, which appears to have its own, if peculiar, merits, is entirely lost, or at least is not considered worthy of notice; yet, according to description, it appears to possess much that should render it highly acceptable to the general fancier or the one seeking a utility fowl of some excellence.



MODERN ROSE-COMB WHITE DORKING COCKEREL
A prize-winner

DARK BRAHMAS.

The property of MRS. CAMPBELL, of Uley.

The Poultry Book

By
HARRISON WEIR, F.R.H.S.

American Edition Edited by
WILLIS GRANT JOHNSON
Assisted by
GEORGE O. BROWN
as Associate Editor
and
Many American Experts

Complete in Eighteen Parts

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This book has been revised and rewritten from the American point of view by American experts.

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THOMAS F. McGREW, New York

"Light and Dark Brahmas"
THOMAS F. McGREW, New York

Photograph by Mr. Nevius

WHITE COCHINS IN OPEN RANGE

Bred and owned by J. D. Nevius, New Jersey

THE SHANGHAI OR COCHIN FOWL

THOMAS F. McGREW, NEW YORK

"Allow not Nature more than Nature needs."—KING LEAR.

NO domestic animal or bird has created more general enthusiasm than did the Shanghai,* now called Cochin, fowl. From the hour of its first coming into both England and America it has been prime favorite with the expert fancier, amateur, and the general public alike. No aspirant for stage honors was ever better presented than were the imaginary qualities of this wonderful breed of fowls. It was not a question of laying one egg per day—any fowl should do as well as this—but the new-found breed, the Shanghai, could and would produce at least calculations two or three per day. These same false declarations were heralded in this country as well as in England. Many imagined them as large as the ostrich or nearly so.

In 1879 the writer began to gather information for a work on Cochin fowls. The following is from the pen of Joseph Wallace, who spent several

* It will be noticed that in speaking of the Cochin fowl Mr. Weir calls them Shanghais. Those who are interested in the full history of Shanghais, Chittagongs, and Brahma Pootra fowls will find them more fully treated in the English edition of this work.—EDITOR.

years in China and India. Being a thorough poultryman, he quite well understood his subject. I quote him just as he wrote over twenty years ago: "With the exception of the domesticated native Game of India, the Cochin and its relatives, Brahmas, Chittagongs, Javas, etc., are perhaps the oldest distinct race of fowls. This may appear strange and perhaps doubtful at first thought, far-fetched, and wholly unsupported by competent authority on Chinese galliniculture, owing to our limited knowledge of the great Chinese empire and surrounding countries. But we anticipated this and have accumulative proofs from Chinese records, missionaries, naturalists, and educated Chinese fanciers to support our theory."

The Reverend Jean Baptiste Proulx, a distinguished linguist and naturalist of Louvain, Belgium, who traveled through China in the first quarter of the present century and spent many years instructing the natives in the arts and sciences, says: "I was astonished, when I first came here, at the slow and patient industry of the people and the number and size of their domestic fowls. Not but there are small fowls in China, like as in Europe, but size is a behest, a specific religious injunction. In no other quarter of the globe is found so large and distinct a race of domestic fowls. This land is really the paradise of gallinaceous birds. The giant race one meets with everywhere have outgrown the records of time."

Father Tachard (or Sicard), the noted missionary and scientist, 300 years ago penetrated into Cochin-China and Tonquin. In addition to his studies, he collected a large fund of information regarding the history, ethnology, zoölogy, and industries of the country. His observations of the domestic fowls of Cochin-China and Tonquin at that early day are much the same as observed by recent travelers. "From what I have learned," says he, "in many parts of the country the domestic fowls receive the greatest care and solicitude, this especially so among the Brahmo-Buddhists and the followers of Khoung-foo-tsee and Leo-tsee, who worship the spirits of their ancestors and believe in the immortality of all forms of life. They will not suffer a fowl to be killed or injured in their presence, and it is enjoined on them by their religion to propagate, increase their size, and care for them in sickness and health, as they are the living, moving temples wherein the spirits of their departed ancestors and relatives dwell, by whose wings they are wafted to eternal life after a certain probationary period on earth."

This belief is supposed to account for the number and size of the domestic fowls of China and parts of India, and the encouragement to propagation is intensified by the hope of a departed relative taking up his abode in a fowl under the care and guardianship of one of his kin. The eggs from each fowl may be sold or bartered for other articles, and those who hold different religious views breed them for their own use and for sale. They also constitute the chief meat food for those who can afford to use them, so this giant race has a large geographical area.

From a drawing by Harrison Weir

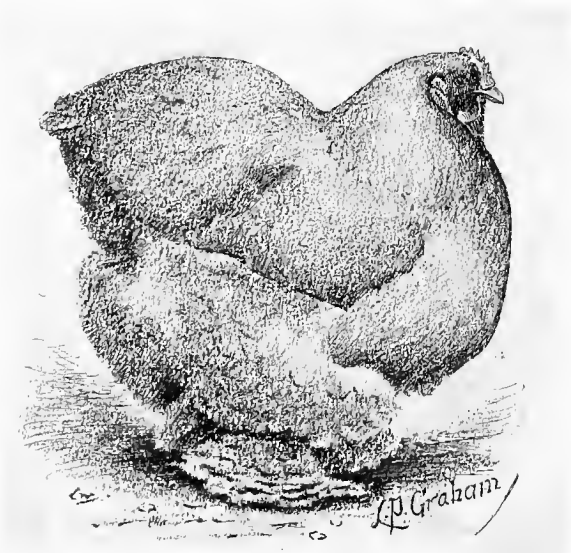
COCHIN PULLET

The religion, tradition, and superstition of some of the primitive races of China show that domestic fowls were coeval with their religion and institutions. In support of our theory of antiquity and distinctness of the Cochin race, we will quote from a learned Chinese naturalist and writer: "The Chinese entertain odd notions regarding the cultivation of animals and plants. Anything peculiarly unique, contorted, or abnormal they try to develop and evolve, dwarf or enlarge, to excite curiosity and turn a ready penny. Young chickens, goslings, and cormorants are often bound to young bamboo stems. The plant grows so rapidly that they are stretched out of all due proportions."

In the populous empire of China habits of industry are necessarily enforced. Breeding fowls and domesticating wild birds are favorite

pursuits among the people. Local governments aid and encourage industry, as the taxes are paid in produce of the land, whether it be in rice, fowl, or goats. Artificial incubation is thoroughly mastered by a class of professionals who travel from one leading part to another plying their vocation on flat boats, but where the pursuit is carried on largely and also naturally is in the *mi-aus*, or retreats, corresponding to the monasteries of Christian lands. They are invariably long brick buildings one story in height, simple and solemn in architecture. The grounds for the cultivation of flowers and wholesome food are ample. Around the buildings are windowless walls symbolic of the busy life forever shut out from view. In the grounds and surrounding lands poultry enjoy undisturbed freedom. They are allowed to make their nests under gnarled trees and beneath creeping vines. The finest specimens of the Chinese race of fowls are bred in these places, and there is an attempt at breeding them to an ideal standard.

There are more than 11,000 *mi-aus* in the Celestial Empire, exclusive of caravansaries, lambsories, and distinctly religious establishments. The number of inmates varies; the highest is that of Tal Sin, with a roll-call of 600, and the lowest is that of Lanchow, with only two brothers. The imperial census shows they aggregate 200,000 men who have renounced the world forever, and have taken up the pursuit of poultry and vegetable cultivation.



Drawn from life by L. P. Graham

FIRST-PRIZE BUFF COCHIN PULLET
Oakland Farm, Massachusetts. New York Show, 1895

In many of these retreats thousands of specimens of Buff and Partridge China (Cochin) fowls are annually raised, and in other places the colors are mixed. The kinkee (gold flower) colored birds are the most esteemed, both as regards antiquity and purity. After supplying the wants of the brother-

hood and distressed travelers, the others are sold for the support of the retreats. Hoang-ho is the oldest *mi-aus*, and its records show that this same race of fowls was cultivated by the brotherhood 1,500 years ago.

Buff and Partridge Cochins are indigenous to the temperate and more southerly portions of the empire. This is corroborated by naturalists and travelers. Mr. Gabb, the well-known English naturalist, says: "According to my view, a black or white Cochin is an improbability, if not an impossibility, as a natural product of a tropical or subtropical region. The natural color of the feathers of the poultry in the zone of Cochin-China would be buff or yellow, or some of the varieties of these colors, but never black or white; except by accidental variation."

George E. Haight, an American well known to the fanciers of this country, visited China and the Straits Settlements a decade ago, and wrote to the *Poultry World* as follows: "I believe in my last letter I promised to let you know if I found anything new in southern China in relation to poultry. Although there are no distinct breeds of fowls bred or known in China by the Chinese, there are yet a great many specimens to be seen in all parts of the empire, and so closely do they resemble each other in general appearance that it is quite difficult to understand why distinctions should be made; but I find that the different names of all the Chinese fowls have been given them by the different foreigners who have brought them from various places in Asia, and that if they have procured them at Shanghai they have called them Shanghai fowls (Red, Gray, and Buff, as the case may be), and if from Hong-kong the Hong-kong fowls, and so on until we have a dozen or more different names for the same variety. That they differ in some minor details is true, for no two can be found of exactly the same color. Some are a chestnut color, others darker, and some quite light, yet they can all be seen in the same yards together, bred at random, and producing many different colors; but in size and shape they are about the same and are known simply as the Chinese fowl.

"In various parts of China (and intermixed with other fowls) can be seen a large, faded, buff-colored fowl, the male bird being a light buff with black penciled neck-hackle, dark wings, and black tail with a greenish cast. Some of them have single combs, others resemble the pea-comb. Their legs are yellow and well feathered. The hen is two or three shades lighter (in fact, almost white), and has a heavy body, short, yellow, well-feathered legs, black hackle, dark-gray wings and tail. These fowls will

weigh about eighteen or twenty pounds per pair. From fowls of this description I am convinced the Light Brahmas originated. I have talked a great deal with old residents of China, some of whom know what our Light Brahmas are and have seen and raised them, and they all agree that they came from the fowls I have described. I am convinced that Doctor Brown was the first to notice them in China and keep them separate as far back as 1840, and that he was one of the first (if not the first) to introduce them in America when he left China on a visit to his father in Connecticut in January, 1847, bringing a number with him.

OLD-STYLE SHANGHAI COCHIN, 1856

"There is an impression in the minds of many breeders at home and abroad that all our present varieties of Cochins are descended from the original Cochin-China fowls sent by the British Ambassador from China to Her Majesty Victoria of England in 1843. This is hardly possible, for the Queen did not exhibit her Cochin-Chinas until April, 1846, at the Royal Dublin Agricultural Society, though prizes were offered for Malays and other Asiatic breeds at the English poultry show held at the Zoölogical Gardens, London, in 1845. Between 1843 and 1846 several private purchases were made from ships coming from Chinese ports. Sir Richard Ansley O'Donnell, of Newport, Mayo, Ireland (father of the present Sir George O'Donnell), had in 1846 a nice flock of deep golden Buffs with small single comb and wattles, black penciled hackles, short black tails, smooth yellow legs, large size of body and slightly tapering to the tail.

"At the same time William Mairs, a Scotch gentleman living two miles from Newport, had a few Chinese fowls, known afterward as Gray

Shanghais. Our informant, Joseph Wallace, while temporarily residing at Newport, received a present of the Shanghais, and many a time, with young Sir George, they tried the mettle of the Buffs, as they were pugnaciously inclined. The Buffs possessed the same general characteristics as those bred by J. Joseph Nolan, of Dublin, to whom Lord Heytsbury, Lord Lieutenant of Ireland, gave the first pair that were presented to him by the Queen in 1846. The Gray Shanghais were more rangy in form, the feathering soft and loose, and a few downy feathers appeared on their legs.

"In connection with the royal Cochin-China fowl, it may be surmised that the original stock was in the hands of others besides those of Her Majesty before 1846, though Mr. Dickson, the English poultry author of that time, in his work published in 1847 makes no allusion even to the Queen's fine fowls. This strange fact is accounted for by an old English fancier, who says that Mr. Dickson's work was prepared several years before the advent of the Queen's Cochin-Chinas, and that owing to the delay of publication, absence and sickness of the author, it went to press without mention being made of these rare and grand fowls, for on no other reasonable grounds could such palpable inadvertency be excusable.

"Some writers seem to cast doubt on the name Cochin-China being an appropriate one for the Queen's fowls and those which subsequently came from China and now classed under the general name Cochin. In Wingfield's 'London Poultry Book,' issued in 1853, illustrations of noted Chinese fowls appeared under the titles 'White Shanghai,' 'Buff Shanghai,' 'Lemon Shanghai,' 'Partridge Shanghai,' etc. In a subsequent issue (1867), under the editorship of Mr. Tegetmeier, the word Cochin is substituted for Shanghai under the illustrations, evidently a more appropriate name, better liked, better understood, and better for the class of fowl, as the name Shanghai, where it became generally known, served as an epithet of ridicule."

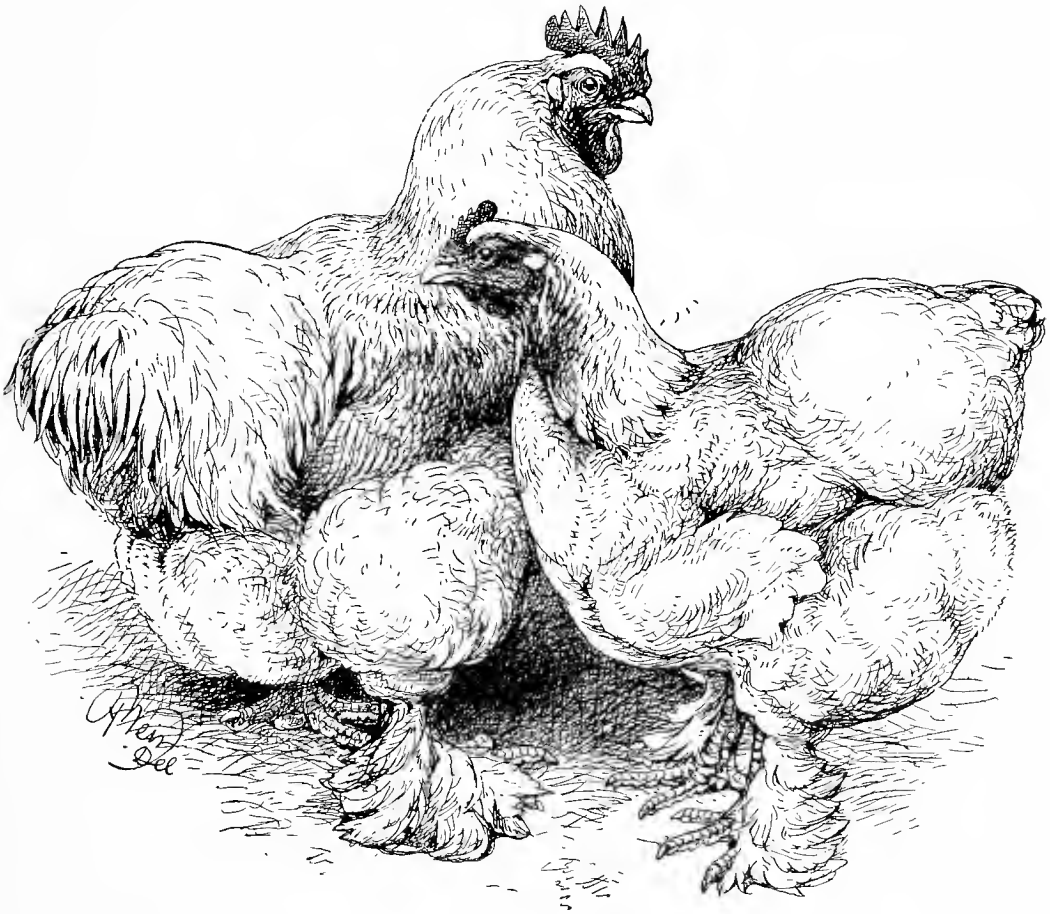
The above statement describes the actual conditions as they seem to have existed. We rest the origin in these words and proceed with the Cochins as they were when described by Mr. Weir, who tells us they were very accommodating as to form and feather. A few were rather tall, some of medium height; with others the shanks were short; while those fanciers that were averse to feather-legged birds could have them clear and clean on those parts and with skins and scales of rose-tinted yellow. Rice and maize were their prescribed food, but being coarse feeders they

would eat almost anything and, what was a great desideratum, fatten on what they had. They never wanted to fly and cared but little for walking; being of such a contented nature, they never attempted to scratch or scrape for their living; given a grass plot surrounded by a wire fencing two and a half feet high, they would stroll and graze their fill and then seek repose and be restfully happy.

As to color, here, again, all could be satisfied. They varied from white to black, from light buff to cinnamon, with many shades of yellow admixture. While the Partridge and Grouse were of the richest hues, the Silver Cinnamon claimed to be the most beautiful. Of the feathers and fluff, it was said that the former surpassed those of the goose for bedding and the latter swan's-down for pillows. The flesh was mellow, flavory, rich, juicy, tender, and plentiful. True it was that in the breast meat there was a deficiency, but then there was the thigh and leg of a sheep in size by way of compensation. No, there never was such a fowl. By its advent a new era in British poultry began. The sanguine prophesied active improvement, while the far-seeing and experienced almost timidly hinted at disastrous deterioration.

At what period or date the Shanghai fowls were imported to England is not very clear. In the early forties, Mr. Weir says, some were said to have been landed in Cornwall, others domiciled in Wales, and Captain Heaviside, of Walthamstow, had some sent to him by Captain Elder, whose letter accompanying them was dated "Off Canton, August 21, 1842." Mr. Weir says he never saw any of these. It was in 1843 that Her late Majesty Queen Victoria received five pullets and two cockerels under the name of "Cochin fowls." A drawing of these appeared in the *Illustrated London News*, December 23, 1843. This picture was made from the birds by Samuel Read, an architectural artist of high repute; but never having attempted the task of delineating along this line, and not in the least understanding poultry, the result bears but a small resemblance to the actual birds. In a sense the drawing is useful, giving as it does the carriage of the two cockerels. In a conversation with Mr. Read respecting the fowls, he described them to Mr. Weir. He said they were very bright and lively, quick and alert, and to his idea very much resembled in form and carriage what he had been shown as Malays. The cockerels were a rich red, with dark marks on the upper part of the breast; the pullets were red, with redder or browner pencilings, and the legs (shanks) of a bright yellow.

Some time after Mr. Weir had occasion to go to the Windsor poultry yards. Asking to see the Cochin fowls, he was told the cocks were dead, but that two of the hens were alive. One of the cocks had been stuffed, and so preserved. Examining the two hens, Mr. Weir found they did compare somewhat favorably with the drawing made by Mr. Read. They were upright in carriage, decidedly of the Malay type, with fairly long tails and no cushion. They had scarcely any fluff on their thighs, but were clean, as shown by Mr. Read. The combs were single, clear red, and small, as were also the wattles. The ear-lobes were larger; the neck hackle somewhat sparse and Malay-like, though the whole of the feathering was very much longer than any Indian fowl he had hitherto seen. In



TYPE OF SHANGHAIS IN 1858

fact, says Mr. Weir, they in no way resembled the feather-shanked fowl called the Shanghai. The stuffed specimen cock was very bright and rich in coloring, the hackles, back, saddle, and wing bow being of a rich, deep, varying orange-red, much deeper on the back; there was no horseshoe in the breast, which was a deep yellowish-chestnut, with here and there a dark feather; the tail was black with a green sheen; the sickle feathers were longer than the others, while the whole tail was by no means small, but full; the tail coverts, especially the lesser ones, were bronzy brown edged with orange; the shanks and feet were strongly made and the spurs large and sharp. It was evidently a bird in at least his third year.

When Mr. Weir went to Windsor again to sketch the Gray Shanghais sent by Burnham in the early part of 1853 he inquired after the Cochins, and learned that all were gone. Not a single pure-bred one remained. The stuffed skin of the cock was still standing in the window, but being without a glass covering it was almost in the last stage of decay. Mr. Weir told this to Mr. Baily, and desired him to go and see the specimen, as it would prove to him that there was no resemblance between those of Her late Majesty Queen Victoria and Messrs. Moody, Sturgeon, and Punchard's Shanghais. He did go and see the fowl. Later, when he met Mr. Weir, he said as far as the specimen stuffed cock was concerned Mr. Weir was right. Samuel Read's drawing shows how widely different the birds were from the Shanghai in build, fluff, feathering, and upright carriage, having clean, rather small-boned, but strong shanks. Thus Mr. Weir is of opinion that these possibly might have been Cochin fowls. Later, at the Zoölogical Society's show, Regent's Park, those shown by Messrs. Baker, of Chelsea, much resembled them; and though by some said to be Malays, the Messrs. Baker assured Mr. Weir that certainly they were not, but imported by them direct from China. It was John Baily's opinion also that they were not Malays as we knew the breed, but a Chinese breed. George Landseer drew one set of these for the *Illustrated London News* and Mr. Weir the other.

Writing of the modern Cochin, Mr. Weir, when referring to vulture or falcon hocks, states that at one time there might be seen in England birds with hocks having long, stiff quilly feathers, both in size and form equalizing those of the primary and secondary wing feathers; then more on the shanks and more on the feet, longer, looser, and more

THOMAS STURGEON'S BUFF SHANGHAI COCKEREL "JERRY
Showing the shape, hocks, and feathering of the bird in 1853

fluffy everywhere, until the birds looked is if they were a moving mass of colored softness of utter uselessness. With all this it had and has its own peculiar beauties—its lines of elegance, its placid habits, its gentleness and entire domestication, which rendered it, and does still even as a curiosity in bird life, worth having and observing. After all, as it is now there is something charming and attractive in this wonderful variation by selection from that of the wildly natural.

But the large, strong hock coverings had their day. Like many other absurdities, they were decried and said to be wrong and unsightly,

but having been the fashion it was difficult to get rid of them. In many cases in exhibition birds this was done by the simple process of pulling them out. Even to this day the deteriorating disfigurement exists in a large degree. What was the first outcome of this feather exaggeration? The more of feathering the less the number of eggs; less inclination or ability in the bird to move about in search of food or even to graze; the flesh became coarser and dryer, and less of it, because much of the muscular system was unused. The feathers took the lime that the bones should have, and so arose twisted breasts, etc. Still, though it has lost utility, it is a fowl apart from all others, singular in aspect, and yet, to Mr. Weir's way of thinking, much to be admired. As they now are, Mr. Weir says, possibly he would not care to keep them, as they require so much care and attention to keep their plumage in condition; but in the hands of others, to whom such careful study is a pleasure, Mr. Weir still thinks the breed a desirable and peculiarly interesting one.

It would be tedious to follow the varying fortunes, the varying colors and forms of the ancient breed. Sometimes their value increases, and again there is a lull in the demand; then a rise, then a fall; but always there are at least a few who want and will have only the best; $50 to $100 or more is now given, not only for the pleasure of seeing, but of having. These are the fancy forms and featherings, but widely differing from the early imported birds which Mr. Weir saw and some of which he kept; they, as Miss Watts describes them, had merely a strip of feathers down the outside of the shanks; these were feathery and cushiony, some of them being well-breasted and meaty birds, while most, if not all, were very excellent layers, but now it is not so with the fanciers' fancy.

In America falcon hocks are a disqualification, yet the hocks must be well and heavily feathered, with plenty of soft incurving plumage, also with the shanks and feet thickly clothed. Still, even this militates against the flesh formation and the fecundity in egg-production.

Yet the Shanghai of to-day is a wonderful fowl, a grand exemplification of the poultry fancier's art, and the marvelous outcome of careful, thoughtful breeding, wise selection, and in no way deviating, but steadily keeping on in the only but narrow path that could possibly end in the full attainment of the desired object—that of perfection. This the Shanghai fancier has attained. He can go no further. He has bred for an ideal which, unprofitable though it may be, still has a certain class of beauty that is

worthy of our admiration. There is a poetic charm about these gentle domesticated fowls that is not possessed by any other; they have a way so confiding and trusting that they seem to belong more to the household than to the poultry-yard. What they were once is one thing and what they are now is quite another. Though they certainly have lost much of that fecundity for which they won fame and notoriety, still the change has not been all loss, for in the Shanghai as it now is we have a breed of domestic poultry grandly handsome and widely differentiated from all others.

These notes relate chiefly to the Buff, and this is a color, as is well known, that has many hues and tints. Formerly a yellow or canary held sway, then a deeper, then a cream, then richer; again paler, tending to a red; again a more solid color, and to-day a vivid yellowish-red, both pleasing and bright. A flock in a green grass-field in its best attire is a sight long to be remembered. This color from the first has ruled the fancy, and for all purposes it is generally known as the Buff Cochin, though none of it but the Shanghai.

From a drawing by Harrison Weir

COCHIN PULLET

The dark, black-breasted brown-reds are noble, heavily booted, massive birds. They and their Partridge-colored hues claim attention and thoroughly merit it; while those similarly marked and known as Grouse, the Brown Grouse also, being of a rufus color, were, when in the hands of Mr. Tuddman, most attract-

PRIZE BUFF COCHIN PULLET

ive, as the brilliant cinnamons—the silver cinnamons—the silver grays, without a tint of brown, red, or yellow. These looked, if not so, near akin to the Brahma. Mr. Weir says he has never seen any blues, but thinks there is no reason why there should not be.

In the fifties the black were somewhat in evidence. They were superb, with a rich purplish-black sheen on their dense colored plumage. Some were imported. They were bred mostly from a buff and a white or, better still, a black and a white. Generally they would come whole colored, either white, brown, or black. A few cockerels of these blacks so bred turned brassy-winged in their second molt, but not all. The hens scarcely ever changed. All had yellow shanks, though some were

slightly sooty, while others were of a rich orange. Of the best were those of Captain John Fairlie, of Chevely Park, Newmarket, and were of a deep purple-black. None of these had the jewel emerald-green of the Langshan, and until their importation such was conspicuous by its absence. Then it was that this latter was declared by the ignorant of both breeds to be nothing more than a Black Cochin, and this with a dogged determination not to be convinced to the contrary. But as dripping water will wear the hardest stone, so it was that the gentle pressure of fact overpowered an ill-conceived obstinacy that should never have existed. But the worst was that these Cochinists advised the Black Shanghai fanciers to throw aside the yellow shank and breed black. Then came muddle and mixture and their enlightenment. Now the black are again yellow-shanked, as they were and should be.

There were two distinct shades of white. One was the pure albino, and the chicks, when hatched, were a light straw color; these had gray eyes and were, when feathered, very white. This variety, when bred with Buffs, never threw dark birds, but mostly mealies or silver cinnamons. The other white was a gray chicken when hatched, and got more sooty, but molted apparently pure white. It was from these mated with blacks that the best blacks were bred. Mr. Weir had some of both varieties nearly fifty years ago; whether such exist now in England he does not know, for the whole of his stock was bought by a Mr. Butler and brought to America.

Mr. Weir thinks the Buff Shanghais will again come into favor, though possibly never to realize their former high position and prices; but their simple habits, quiet, tame, gentle ways, their color and singular beauty must, he believes, again reassert their presence and, however reluctantly, bring them many admirers. Perhaps it is the trouble and difficulty of showing them in high condition, the washing, etc., that has somewhat tended toward their neglect. Even if that is so, might they not be kept about our grounds as ornaments and as fowls usefully so? for, being non-scrapers, the damage, were they to attempt it, would be so slight as to be almost if not quite unnoticeable.

The Cochin Fowl in America

There cannot be any compromise between the types of modern English and American Cochin. While both have the same general origin,

they are so different in form and feather as to be almost a separate family Early in the nineties there was an effort put forth to introduce the English type into this country as full-feathered Cochins. Thousands of dollars were spent to push them into popularity, but the venture was a failure and the supremacy of the American type of Cochin was fully established. The main difference is in the length of legs, hock feathering, and the shape of breast. We favor the short legs, full, soft fluff and hock, full, round breast and forward carriage, while the English Cochin has long legs, long, stiff vulture hocks, and flat, high-carried breast.

The early-day Cochin in America was not so fully feathered as now; in fact, the Cochin of fifteen years ago, for shape and feather, was quite like the present-day New England Brahma; but with the coming of the full-feathered Cochins mentioned above came the ambition and determination to have equally as much fluff and feather as they without the vulture hocks, long legs, and flat breasts. Along these lines have been built the beautiful Cochins of to-day. They have all the much-admired feather any one could wish, and none of the objectionable points raised against the English type. We now have them far in advance of ten years ago and far ahead of the whole world in form, feather, and color.

When the American standard was first compiled we had the pale or lemon, the dark or cinnamon, and the true buff colors. In the face of this and the fact that three separate classes had been the rule for shows prior to this time, the standard of 1868, the one original as compiled by A. M. Halstead, declared for the one buff color, then termed for males "rich, deep golden buff," for females "uniform, clear, deep buff throughout." This was changed somewhat by the American Poultry Association in their standard of 1875,* which called for rich, clear buff. Since that time the tendency has been for a uniform color of an even shade of golden buff throughout, the male and female as nearly one color as it is possible to have them, now described as "rich golden buff."

The original of all Cochins as they came from China were pale or lemon buff, dark red or cinnamon buff, and brown or Partridge color. Whites and blacks came later, but were very scarce. The pale or lemon Buffs and the pure white had originally the most feather and the more

*A. M. Halstead compiled and owned the original American standard of 1868, 1870, and 1871. This was absorbed by the Poultry Association standard of 1875, now "The American Standard of Perfection."

rotund or Cochin form. We noticed this from the very first. It is recorded that Mr. Sturgeon selected the pale or lemon from all the rest for their beauty of form and feather. This might naturally be, for the Buff is the favored color of the Chinese empire, and would, through preference, have the most care and attention bestowed upon them. This condition would improve or finish them to a truer type than might be with the others.

BUFF COCHIN COCKEREL

From the very earliest importation, a cinnamon cock and hen and a Partridge-colored hen (she in reality a brown-penciled hen), there were produced specimens, some of which were lemon-colored, while others were Partridge-colored and still others cinnamon in color; all three shades from the one deep cinnamon-colored pair and the brownish or Grouse-colored hen. This seems to show plainly that all colors must have been bred promiscuously, as was our early-day barnyard fowls and the Rhode Island Reds prior to their separation into exclusive varieties. We have seen Cochins in the show-pen of the then-called Cinnamon variety of about the same shade

Photograph by courtesy of Mr. Nevius

WHITE COCHINS IN THEIR SUMMER QUARTERS
Bred and owned by J. D. Nevius, New Jersey

of color as are many of the Rhode Island Reds of to-day, and they did not reproduce much better at that time than do the Rhode Island Reds of to-day. We have seen two or three shades of color, all from one clutch of eggs laid by a single hen and mated to but one male throughout the season.

The writer has constantly bred Cochins for nearly forty years, but not in all this time have I known of a strain of Buff Cochins that would not show from time to time the early day evils of cinnamon color, red wing bows, black in wings and tail, and black marks or stripes in neck hackle. It was not unusual in early days to have female Buff Cochins show quite as much striping in hackle as did the Brahmas of the time. This striping is shown in a colored picture made by Mr. Weir prior to 1853. Our standard of 1875 mentions that black at end of hackle is not a disqualification. This fact I made prominent as a connecting link between all our Asiatic fowls. Mr. Weir would add to this the pea-comb of a variety called "Pea-Comb Partridge Cochins," but I rather think that strain was produced through a Dark Brahma cross.

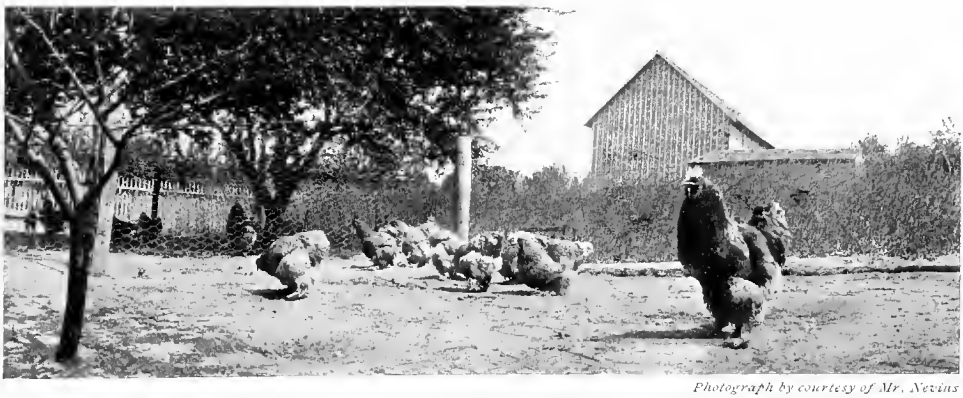
In early days we had the Shanghai, the Chittagong, and the Brahma-Pootras, all of which came from the Asiatic countries. They must have been related one to the other, as are the Chinese of the several provinces, who differ quite as much as did the early-day fowls from their land. Each has been guided into its separate form, differing much in the same breeds and varieties, not only in this country and England, but in the extreme localities of China. If this is true of the present-day fowls as we find them

after years of care and breeding, we should not wonder at the several forms and colors, combs, smooth or feathered shanks in earlier times.

The true Cochin is a bird of feather. The more profuse they are in plumage the better Cochins will they be considered, providing they are rotund of form and true to Cochin type and variety color. They should be deep and massive of form, strong and vigorous, with an attractive dignity of poise that is so suited to their form. They have a natural tendency to lean rather downward or forward, which gives them the low carriage of breast. With the breast carried low and the cushion well up, you have the great depth of body through these sections. This, with the full fluff, leg and toe feather, unites to build out the massive form in feathers of the true Cochin.

The massive form of feathers is built out by the excess of down or under fluff of the Cochin plumage, which largely overbalances the web. This excess of fluff builds out each section into the rotundity of form that gives to the well-feathered Cochin the appearance of a ball of feathers. With all this there should not be any stiff or vulture hocks. Plenty of feathers may be obtained and maintained without the extended stiff plumage at hock, and plenty of form and feather may be had with good liberal size and a full round breast. All of this is an absolute necessity for the true Cochin, and any deviation from these lines detracts from true quality and desirability.

In type, shape, or form all Cochins should be the same, no matter what the variety color may be. The shape must be the same in all.



Photograph by courtesy of Mr. Nevius

BUFF COCHINS AT HOME

Bred and owned by J. D. Nevius, New Jersey

The head, broad and deep and full over the eyes, where the head and neck join, is plainly shown by a slight ridge or juncture as called. The head is ornamented by a nice, even, well-balanced comb. It rounds off to conform to the shape of the head. The finish of comb is smooth and free from all unevenness, supplemented with full pendant wattles and ear-lobes that hang almost even in length. The former the largest and longest; eyes bright and attractive, bay in color; the head gracefully placed upon the short, full, handsomely arched neck with its long, flowing hackle that sweeps well over the back. This rounds up the one-fourth of the specimen in what may be called the introduction to Cochin beauty. There is seldom seen upon a fowl a more attractive portion than is presented by the true Cochin head and neck, the form and carriage of which is grace itself.

The back, saddles, and cushion unite with the tail to build out Cochin form; the full-flowing hackle that comes so far down over the back of the male unites with these to build out or round up the shape and shorten its appearance. The saddle, or cushion, should begin to take form just where the flowing hackle ends; the dense under fluff of the plumage of the back builds out the cushion into almost a perfect half-globe; the spread of the main tail feathers under the coverts backs up or maintains the shape of the cushion as if the entire cushion and tail was one and the same. The tail of the male should be short and spread at base, and well filled under and between with a profusion of soft feathers, the whole hidden away beneath a profusion of coverts and lesser sickles; the more of these the better, so as to almost hide from sight the main tail feathers. The beauty and finish of the Cochin male depend very much upon the length of feather about the cushion and tail. The longer and more flowing these can be the greater the beauty and finish.

The breadth of shoulder is of vast importance, as is the cupping of the wing bows; the filling out of the muscles under the wings rounds up same and adds to the rotund form of body. With this goes the full, round breast of both width and depth; these supported by a long, full underbody give the massive form so much to be desired in the Cochin. Great breadth between the thighs and shanks allows the body to fill in and settle down between them; the long, flowing or profusely fluffy feathering about abdomen and thighs entirely hides from view the hock

joints without the presence of any stiff hock feathering. About the hocks should be profuse feathering that rounds up about same, but no vulture hocks; the feathering of shanks should join in under the hock plumage so as to avoid any appearance of a break between the thigh and shank plumage. All this profusion of long, soft feathers above the hock joint should be upheld by strong, heavy shank and feet that are entirely hidden by shank and toe feathering.

Photograph by Prof. W. G. Johnson

WHITE COCHIN
Prize-winner at New York, 1902

The female must conform to the general make-up of the male in a feminine fashion; the shorter hackle plumage gives her a longer appearance; the shape of cushion makes it look larger; the main tail feathers gathered together in the center of the rear of cushion often droop a little, as if weighed down by weight of cushion; the low-carried breast and shorter legs give her the very low carriage so much to be desired. The most complete Cochin hen is almost round in form and so profuse in feather as to be called a ball of down. Both the male and female must be round of form in every section, without any flat formations on either back or breast; well rounded up and profusely feathered in each and every section is the rule for quality.

The Buff Cochin

No mention can be made of this variety of Cochins without bringing to mind the names of Sturgeon, Moody, Baily, and Proctor, of England, who have done so much to improve the Cochins of their country, as have Williams, Pool, Crosby, and Doolittle to establish the supremacy of this variety of Cochins in America. Mr. Pool was the first to have the males and females of the same shade of color of a quality that stood supreme in the show-room. The writer originated what was known as the "Gold-Dust Strain," the first to have one even shade of buff throughout without foreign color. To Messrs. Sharp Brothers, of Oakland Farm, belongs the credit of the modern full-feathered Cochin of the present, they having completed the work that had been started by the others, after a fashion that has gained for them and their Cochins an international reputation.

This variety of Cochins was the first of all Buff fowls. From them, it is claimed, has been drawn the color or start for all Buff breeds or varieties. No color is more difficult to fully understand or handle, none more beautiful than a perfect shade, and none less attractive than a bad shade. To be near perfection the Buff Cochin must be of true Cochin shape and one even shade of "rich golden buff" throughout, and free from other foreign colors. The under color should be of a lighter shade than surface color; surface color or the color of the web of the feather to be so close or dense as to preclude the possibility of mealiness or white ticking showing in the plumage. The thin or washy shade of color should be equally condemned with foreign color. The true golden buff is the only shade that looks well and holds its own under all conditions. It is the only shade that can be depended upon to reproduce good quality.

There has been a tendency to favor the thin or lemon shade in all Buff fowls. This is an error; usually all such have white under color; they cannot possibly reproduce even as good color as they possess, and the greater part of their progeny will have white in the wings. This came as the result of sacrificing all to a light surface color to be rid of the black in plumage. The only way to gain or have true, even buff color is to use only such in your matings for the reproduction of better than you may have. The presence of black in any part of plumage of the parent fowls assures a deeper shade of plumage on their chicks, while white or white under color also softens or reduces the shade.

By permission of Messrs. George Routledge & Sons

WHITE SHANGHAI COCK OF 1853

Bred by Mrs. Herbert. Owned by Mr. Sturgeon

There are two peculiar things about the buff color of fowls. The males at two years old generally have a deeper or darker shade of surface color than as cockerels. On the other hand, the hens have usually the reverse. By inbreeding there is usually some loss in color between the parent fowls and the chicks. For this reason we must mate to overcome or allow for this. Naturally if unguided the males would be considerably darker than the females. This was originally true of both the Cochins and the Cochin Bantams. Only after years of constant care has this been brought under our control, and to this time must be continually guarded against.

There are three plans of mating for color, while there is but one for shape, if we produce the best type of Cochins in size, form, and feather.

TYPE OF THE PRESENT-STYLE COCHIN

PRIZE WHITE COCHIN

The necessary qualities should be present largely in the parent stock. Do not hope to produce good size, shape, or feather from stock lacking these qualities. Size comes largely from the female, while color and finish are transmitted through the male. Select only as producing-stock the very best specimens. Pay special attention to head, comb, wattles, ear-lobes, and eyes. Have the eyes bright and bay in color, indicating both health and vigor. This is an important factor in obtaining good results.

In mating for color select the male of a shade or two darker than the female. The breast color of the male should be a full shade darker than that of the female. In under color the male should be rich and true to the skin if possible; in both the shade or tinge the under color should be some lighter than the surface color. Hens true in color shade when

pullets may be used, providing the under color is good. Hens that hold their color at two or three years old invariably produce the most valuable stock for exhibition purposes. I once possessed a hen that at four years produced some twenty chicks, fourteen of which made presentable exhibition fowls. All her progeny were valuable producers. When bred in line from such stock true color may be established and maintained.

Never make use of poor, thin, or mealy colored Buffs in hope of improving stock. Better kill or discard as breeders 400 of poor quality and stick to four of the proper quality. In selecting the male a shade or more darker than the females with which he is mated, we provide against the natural loss in color mentioned above. By so doing one should have both males and females from this mating the proper shade of buff for the exhibition room. This is what would be called single or standard mating, or the producing of both males and females of exhibition quality from the one single mating.

Some of the very finest exhibition specimens are produced through a system of double matings—that is, to mate separate pens, one to produce males, the other to produce females. In this way are produced some of the most beautiful pullets. For producing males the same rule as described above is followed, only the shade of the breast color of both may be uniform. For producing pullets they mate together hens, pullets, and male birds, all of what might be called almost a lemon shade of buff. In the pairing of these soft shades some beautiful pullets are produced, but seldom a high-class exhibition male is gotten. It is true that some beautiful males have come from such matings, but they are always a light shade. Some females produced in this way have improved as exhibition specimens as hens over what they were as pullets.

When the double matings are followed the two lines of breeding must be kept separate and distinct in the standard or single matings, but the one line must be kept up. In either or both the breeder should always know the individual hen that produces each chick. Some hens will not lay an egg that will produce an exhibition specimen, while almost every chick from another hen may be of the highest quality. If one knows the parents of each individual chick and reserves as breeding-stock only those that have produced the best, a strain of producers will soon follow that may be depended upon.

Line breeding, close breeding, and inbreeding should all be considered

in the handling of Cochins of all kinds. The breeding in line from a well-selected lot of ancestors is called line breeding. This is breeding for the purpose of concentrating into the stock all the good qualities of the selected ancestors. In this way is established a strain that should have the power or quality of reproducing better and better all the time. In this way only can one have both good form and color. To hold or to continue this

From a photograph by W. Goshawk

BUFF COCHIN COCK

Owned by Messrs. Baily & Son, England

First prize, Birmingham, 1901 and 1902, and second prize, Crystal Palace, 1902

reproducing power in a strain one must breed very close. To aid in this one should at all times select the most vigorous for breeding-stock. The most promising pullets should be kept for hens next year and mated with the best cockerels. Never mate full brother and sister under any conditions. For the introduction of new blood it is always better to obtain the best female possible, mate her to one of your most perfect males, and gradually work the result of this mating into your flock, providing they are of good quality. If this cross does not give good results, better discard them all and try again with another female. Violent crosses will ruin any well-established strain of Cochins; such are more injurious to Partridge Cochins than with any others.

White and Black Cochins

All that has been stated above regarding the Buff Cochins may be followed with confidence in handling the White and Black varieties. As stated, form and feather should be the same in all; the color is simply the variety distinction by which they are known. The very same laws rule in mating these for size, shape, and color. There are certain set rules for color that must be followed if we hope to produce exhibition quality in these. It is quite reasonable to presume that no one would select these of all others, the most exclusive of high-class fanciers' fowl, unless their wish was for exhibition quality. We have known Cochins to produce 140 eggs a year, but this is not usual with those of the highest quality. The maintenance of their profuse feathering detracts somewhat from the egg yield. We are familiar at this time with a flock of Cochins bred for winter laying that do quite as well as any of the American varieties, but with these exhibition qualities and feather have but little consideration. All Cochins are fully the equal of our American breeds for table use. We know this as a result of years of experience.

The White Cochins have continually possessed fairly good form and feather. They have lacked somewhat in size and color, but these have so improved in the past few years as to grade them close to the winning Buffs. For some unexplained reason neither the Whites nor the Blacks have gained public favor or attention as have the Buff and Partridge varieties. It might be said that there was a prejudice against their color. This might be with the Blacks, but cannot be attributed to the Whites, for there is and has been a continual increase of favor and attention

bestowed upon White fowls of all kinds. There are the same difficulties to overcome with these as with all of our American White varieties—namely, the influence the yellow skin and shanks have on the color of feather. It is most difficult to have the pure white plumage where these influences contend for supremacy.

Pure white plumage throughout is the absolute rule for color in this variety. To have and maintain this at its best calls for great care in selecting and pairing of stock. Pure and absolutely white to the skin must be the entire plumage of the producing-stock, or one will fail in producing pure white offspring. If either the male or the females show creamy white or yellowish white in surface or under color, its influence will be cast over or through the entire plumage of their offspring. It is absolutely necessary to have pure white-plumaged Cochins for producers to gain the best results; when breeding-stock for generations has been of this true white plumage, the breeder may depend upon pure white chicks. Following this line, one will lose some of the rich yellow color of shank and skin, but this is of no importance, either for market or exhibition, so long as a yellowish shade of shank is maintained.

By selecting as producing-stock those that have the very best form, feather, and color year after year, you will build up a line or strain that may be depended upon to reproduce of the best quality. Keep up this trait by selecting continually the best for your own use. Maintain size and feather in the same way by selecting the largest and best-feathered hens. In addition to all this, hatch as early in the season as possible and feed continually for size, bone, and plumage. It is of advantage to select their food in reference to its influence on color. White corn is best at all times for White fowls. Yellow corn will influence the color of plumage if fed during the season of molt. Wheat, hulled oats, and white corn are the best grains for White Cochins at all times. Never feed the mature stock so much as to make them fat. Feed the growing stock all you can get them to eat.

To obtain the proper shade of black, glossed with the rich beetle-green sheen, upon Cochins, the greatest care in selecting and mating the parent stock must be observed. At the present time it is desirable to have Black Cochins as rich in metallic luster as are the Langshans. This has been accomplished by mating of the richest-colored specimens to be had. This may be continued as long as it does not bring markings of bronze

or red into their plumage. The presence of too much color will have a tendency to cast a purple or bronze finish through the plumage of both males and females. The same may also bring red feathers into hackle and wing bows. This is the natural reversion to the Black, Red, or Malay influence. The males that show these red markings are of value to improve color in strains of Black Cochins of dull color and enrich the color of the females.

The males of the Black Cochins have naturally the richest color of plumage. At times it is necessary to keep down the producing of too much color in the males through the use of females of a dull shade of black. Often the very best males are produced from rich-colored males mated with dull-colored females. The best colored females will come through the mating of the richest colors in both males and females. The darker the under color of the breeding-stock the more assurance of good surface color. There is less chance of white showing in plumage of the offspring of parent stock that has rich surface and dark under color throughout than from stock with light or slate-colored under

From a drawing by Harrison Weir

COCHIN COCKEREL

Dairy Show, 1893

color. The darker the beak, shank, and under color the more assurance of proper color of their produce. No matter how dark the color of shank, the darker or blacker they may be the better for breeding good color. Just so the bottom of their feet show the yellow color. The absolute distinction of color between Black Cochins and Black Langshans is as follows: Black Cochins, shanks and toes black or yellow, black gradually shading into yellow preferred; bottom of feet yellow. Black Langshans, shanks and toes bluish black, showing pink between the scales; web and bottom of feet pinkish white.

The maintenance of these colors assures the yellow skin and meat for the Cochin and the pinkish-white skin and meat for the Langshan. The intermingling of the two destroys these features and makes it quite possible to detect the mixing of the two. Some years back many of our Black Cochins showed the influence of the Langshan blood that was introduced to improve color. This is gradually disappearing, and we now have by far the best Black Cochins ever bred in this or any other country. They excel in all the Cochin qualities, including size, form, and feather. The best Cochin cockerel shown in America during the winter of 1901 and 1902 was a Black of astonishing quality. No Buff had surpassed him in quality up to that time, but during the winter of 1902 and 1903 Oakland Farm exhibited a Buff Cochin cockerel that excelled any Cochin that has been shown in this country. Always strive for the very highest Cochin characteristics in every variety. Follow this with the very best possible color and markings to be obtained in each variety. This rule has been continually followed by American fanciers. Therein is the secret of American successes in producing Cochins of the very finest form and color.

The Partridge Cochin

The color of the Partridge Cochin is one of the most striking combinations of shade and color found in domestic poultry. The Malay or the Games of the black-red type must be responsible to some extent for the foundation color. But the present-day finish of beautiful shades of color—rich black striping of hackle and saddle of male and the mahogany color of female so beautifully penciled all over with a darker shade that conforms in its markings to the shape of each feather—is the result of continued care and judgment upon the part of the careful breeder of this

variety. Not many years ago we had the salmon- or clay-colored breast upon the females of this variety of Cochins, somewhat like the Brown Leghorns have to-day, but now every feather of the body and breast is penciled throughout. Formerly the color of both male and female

From a photograph by W. Goshawk

PARTRIDGE COCHIN COCK

First prize, Birmingham, 1902 Owned by Baily & Son

was not of the most pleasing character; to-day it is rich and beautiful throughout.

There is a wide difference in the color of the English and American Partridge Cochins. In both males and females the English types are of a lighter shade of color. The top color of the male, according to the

English standard, is orange or golden red, while with us it is a bright red or a dark orange-red. For the females the English fancy demands a "light brown penciled with a darker shade." We have the rich mahogany-red penciled with brown or black. The English style of color rather leans toward the orange-red or even more of a dark yellowish shade than an orange-red, while we prefer the deeper or dark cherry-red shades. At times they show a shading or ending of dark orange in both the hackle and saddle of male, while in females we aim for the deepest shade of mahogany-red for ground or body color.

It has been almost an impossibility to produce the highest class of exhibition specimens from a single mating. Some have been produced from the single line, but few, however, have come in this way. To have the bright-red top color of the male heavily overlaid or striped with bright

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DARK BRAHMAS, 1853

metallic black in hackle and saddle and often on back debars the possibility of having the dark or orange-red hackle and mahogany-red body color distinctly penciled with brown or black in the female. I will describe the highest class exhibition specimens for color as preferred by the American fancier, and follow this with a description of how they are produced.

The top color of the male one even shade of bright red from head to tail coverts, with a darker shade on back; the hackle and saddle heavily striped with metallic black that has the appearance of having been laid over or on top of the other color. Often the entire plumage of the back is striped with the black, the shape of the black striping conforming to the shape of the feather; coverts, sickles, main tail, and under filling glossy greenish-black; some of the lesser coverts edged with red; under body color a rich, deep black. If rich in sheen or metallic luster, so much more desirable. The entire plumage throughout bright and lustrous. Some highly meritorious specimens show some inclination to an orange shading at end of hackle and saddle. This is undesirable, but may be overcome by other high qualities.

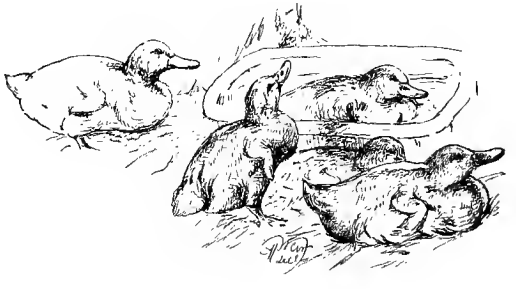
The female bright red or dark orange hackle, striped with black. Often this black striping is penciled, but the edge of red must be clean and clear from dark or black shadings; the entire body color mahogany-red penciled with brown or black, this penciling to follow the shape of feather; wing primaries and secondaries darkish brown or blackish brown; inner web of secondaries penciled with the lighter color; main tail feathers black, some of the upper ones penciled; coverts penciled like back plumage. It is not unusual to have the entire shank and toe plumage penciled like body plumage, many specimens so rich in sheen as to glisten in the light.

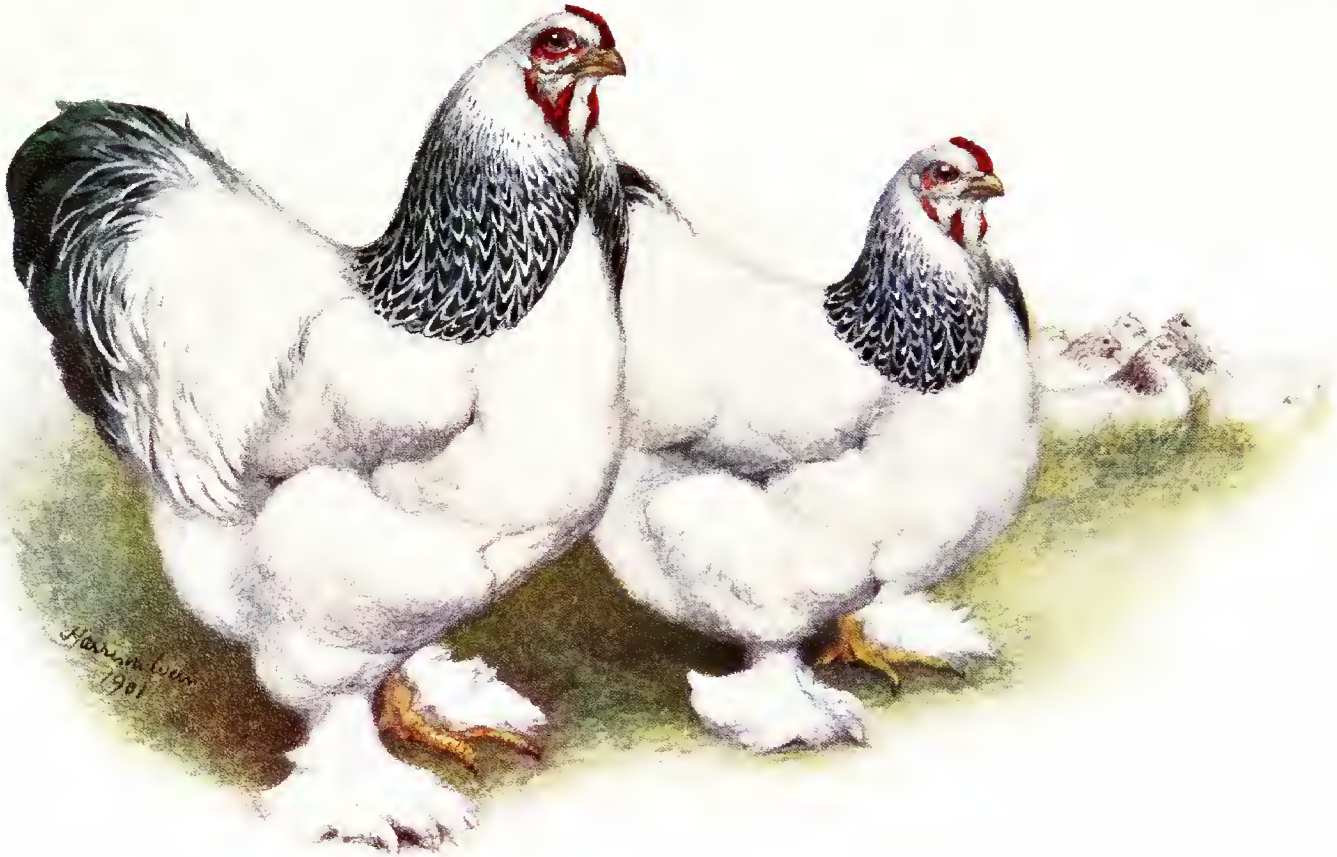
To produce such specimens demands the highest art at mating for best results. The male strain must be kept separate and distinct from the female line, but few if any exhibition females come from this sort of breeding. The most elegant males, with the richest top color and heaviest striping, mated to very dark females that have hackle color that almost equals the males, will produce this style of males. These females must be bred in the male-producing line the same as are the Barred Plymouth Rocks. To establish the female strain, mate the son of the very best hen you can obtain to a perfect exhibition female. Follow this line of mating year

after year; never introduce the male strain into this line of breeding, but always introduce the new blood through the female.

Males for producing females should have the orange color in hackle and saddle and rather light under color, but it is quite possible for this to come with some of the specimens bred from the male line. For this reason the only safe way is to know that the males used for producing females are the direct descendants from hens of the highest character that were mated to males rich in the true female line of breeding. In no other way can or will you succeed. We stated above that a few exhibition males had been bred and successfully shown that came from mating that had been bred for years to produce exhibition females. This, I have no hesitation in saying, is the most successful breeding-strain of Partridge Cochins in America. They have been built up by years of continued study and care by George W. Mitchell, of Connecticut, a life-long ardent lover and fancier of this variety of Cochin.

There are a few important factors in the production of Cochins that must never be overlooked. Never make use of females of small size. Do not hope to produce good Cochins from medium or poor quality stock. To succeed, the breeder must have the true Cochin type, including size, form, feather, and color all combined in his producing-stock. True Cochin characteristics cannot be gotten and maintained in any other way.





LIGHT BRAHMA POOTRA COCK AND HEN.

Photograph by courtesy of "Reliable Poultry Journal"

LIGHT BRAHMA PULLET

LIGHT AND DARK BRAHMAS

THOMAS F. McGREW, NEW YORK

"Man is the measure of all things." — CLAUDIAN.

THERE has been continued contention for years in England as to the origin of the Brahma. Mr. Weir, in the English edition of this work, holds strongly for what may be called the Burnham "Gray Shanghais." Lewis Wright has continually opposed such origin. It is quite true that George P. Burnham had these Gray Shanghais, and that he sent some of them to England, as mentioned hereafter. However, there are other sources from which came better quality according to American notions of what the true Brahma should be. Of this Mr. Weir says: "Nine birds were sent from America in 1852, as a present to Her late Majesty Queen Victoria, by George P. Burnham. None of their antecedents were known, and only now by such revelations as Mr. Burnham has deemed fitting to make in his book entitled 'The Hen Fever,' published in 1855, and his later work, 'The China Fowl' (1874). It would be well to make such excerpts from these as are necessary to show in some degree the origin of the breed as first exported to England.

"The Gray Shanghais presented to Her late Majesty Queen Victoria were the first arrivals. It must be at once apparent that from the name then given them by Mr. Burnham it was possibly nearly the correct one.

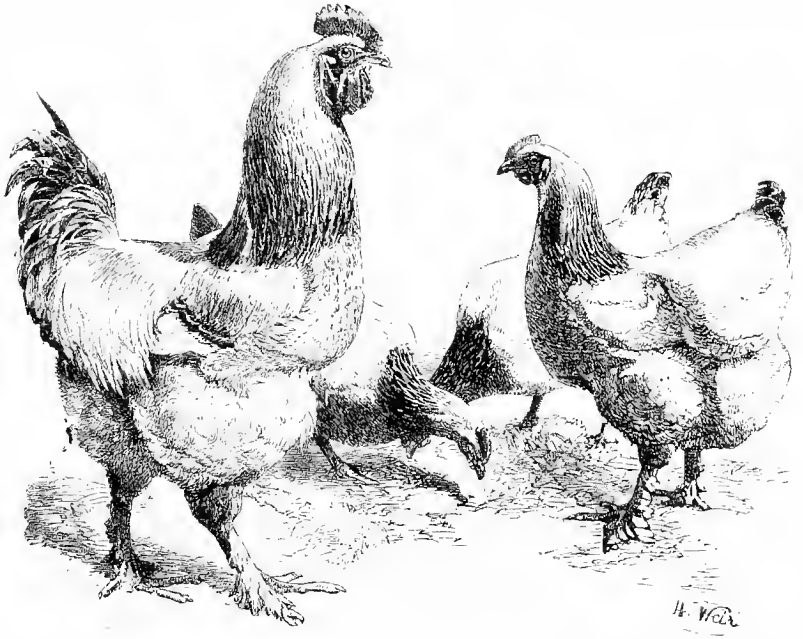
He did not call them Brahma Pootras, nor did he pretend or assert that they were aught else than what he represented them to be. What followed this importation as to name, etc., had little or nothing to do with these birds, which were sent as Gray Shanghais, and no reference whatever was made to any other color or breed. He had some fowls of this gray color, and as such he sent them to England. But let him speak for himself, as he does in 'The Hen Fever' (1855): 'An ambitious sea-captain arrived at New York from Shanghai, bringing with him about 100 China fowls of all colors, grades, and proportions. Out of this lot I selected a few gray birds that were very large and consequently very fine. I tried these with other gray stock that I had at once.' (Here it would be right to remark that Mr. Burnham does not state what that gray stock was, but it is not at all unlikely that they were from his pair of birds imported in 1849, and which are spoken of in Doctor Bennett's 'Poultry Book,' 1854, as Chittagongs.) 'I soon had a fine lot of birds to dispose of, to which I gave what I have always deemed their only true and appropriate title (as they came from Shanghai), to wit, Gray Shanghais.'"

Mr. Weir made a water-color drawing of these, and it has been used for many years as "copied from the *Illustrated London News* of 1853." Mr. Burnham's statements and writings on poultry are scarcely considered serious by Americans. There is no breed of fowls so near and dear to the American fancier's heart as the original Brahma. The Brahma preferred in America and selected as the true and only proper type come direct in line from what are known as the Chamberlain origin. The American fancier is exacting as to form and color, and to his notion the Chamberlain stock is by far the most desirable in all Brahma qualities. The English type of Brahma would not attract attention in this country. They have more hock and feather than is considered desirable even for Cochins with us. Just how the Chamberlain strain was started or from where the originals came it will never, we presume, be truly known. At the same time they have the full credit with us of being the original of our American Light Brahma.

The original White or Gray Shanghais had single combs, while the Chamberlain Brahmas have the well-established pea comb, much like the comb of the Aseel Game. This comb is of vital importance to our Brahmas, as is the overhanging skull, quite different from the head of the Shanghai (now Cochin). These two features are cultivated and

admired as Brahma characteristics. They are features of beauty that belong to the Brahma as their emblem of purity of blood and high quality. Without them they are of no value as Brahmas. The more complete they may be of finish the greater their value.

There is but one rule for shape or form in Brahmas, and both varieties must conform to it or lose caste as Brahmas. The shape or type is absolute, and unless the specimen has this to a marked degree it will not be classed, even though the color may be superb. Type and shape must have the supremacy in the selecting of a good Brahma, but even in this there is considerable of a difference of opinion. The leaders of the New England Light Brahma Club favor a Brahma that has rather more of what is called a Cochiny type than is selected as a preference by the Brahma breeders throughout what is known as the Middle West. The difference in these two types largely rests with the having of more underbody, plumage, fluff, and toe feathering, with the shorter leg, and a slight stoop or a recline at the knee, the preference of the Middle West being for a little more length of shank, a straight poise at the hock joint, no recline or stoop, and less of fluff or under feather. While these two distinctions



From the "Illustrated London News"

QUEEN VICTORIA'S LIGHT GRAY SHANGHAIS, 1853

are plainly recognized in America, neither one of these forms leans toward the English type as shown so plainly by Mr. Weir's illustrations of Crystal Palace winners. Their type of bird would not even be considered in the Brahma class in this country. In fact, our Cochins would scarcely show as much forward carriage and feather as Mr. Weir illustrates on their Brahmas.

In pursuance of this Mr. Weir states: "Now, it must be admitted on all hands that in this particular direction the Brahma fancier has got as far as he can well go, and the differences between it and the Cochin have been so lessened that, with the exception of the pea comb and the slight variation of the skull, they are now so small in some cases as to be scarcely apparent. With almost the same fulness of fluff, the heavy foot and shank feathering, both have now hanging dewlaps or gullets, and both have the Shanghai falcon hock; true, the one has a tail and the other scarcely any, yet neither on their first importation had these—shall I say defects of heavy feathering?—neither the misnamed Cochin, the Shanghai, the Gray Shanghais, afterward called (though not by their exporters) Brahma Pootras, nor the Dark Brahmas that Mr. George P. Burnham sent over in 1853. I am willing to—in fact I do, and others do also—admit that both the Cochin, Shanghai, or the Brahma Pootra of to-day are wonderful in their way and in a sense beautiful; but for all that, the judges have been highly to blame in allowing such properties to become so far in the ascendant as to almost, if not quite, annihilate their more valuable qualities.

"One of their peculiarities has not been impaired, and that is the hardiness, feathering, and quick growth of the chicken. These, as far as I can learn, still have that reputation, though it is said, and possibly truthfully, that they do not carry the large and fleshy breast that, as among the Asiatics, first brought them into notice; still, even this might yet be remedied by careful selection for flesh instead of feather properties, and let us hope that better counsels will prevail in this direction.

"In my opinion, the American Brahma is of better quality for the table, and as a layer of colored eggs far surpasses our English improved breed. The breeding for quantity of feather and feathering has rendered ours much dryer and longer in the fiber of the flesh; then, again, the large size of the falcon hocks is absolutely a positive waste of vital power, nor does it add to the beauty; while it renders the poor bird's ambulatory powers unsatisfactory and ungainly. If the Brahmas of the present are

compared with those of 1853, the loss of the round fulness of the breast will at once be observed, while the thick necking of the hackle and generally clumsy make will also be apparent, though they still retain the American Chittagong head. Yet in most, if not all, other respects they have the general appearance of the heavily booted and falcon-hocked English strains of the Shanghai, which latter now appears in such an exaggerated form, whether beautiful or not, as never was or could be anticipated by us

PRIZE LIGHT BRAHMA PULLET
Crystal Palace Show

old Shanghai fanciers of 1851–53. Had the judges of the Dark Brahmas adhered to the type of the 'hundred-guinea pen,' as it was called, sent to this country by Mr. Burnham, we should have possessed a far handsomer fowl, and one of much higher table qualities than the judges' notion of this now too-heavily feathered fanciered bird of to-day.

"It must be admitted on all hands that the utility of certain strains differs widely, some being more fleshy, others far better layers. This must be reasonably expected when they are kept with care and intelligence exercised as to the full development of the particular qualities that are

most desirable. As an instance of this, Mrs. Campbell, of Uley, Gloucester, may be honestly quoted as deserving honorable mention, she having succeeded in breeding prize birds of both sexes from one pen. This is as it should be, and there can be nothing more prejudicial to the general fancy than that of fanciers who feel obliged to have two pens of fowls—one to produce cockerels and the other pullets. When this lady went to live at Uley, about 1891, she had a few Dark Brahmas. Five eggs from the breeding-pen were set under a half-bred Bantam hen, from which resulted five chicks—three pullets and two cockerels. One pullet was never exhibited, but the other four achieved victories in the show-pen. The handsome cock whose portrait is given and one of his sisters both gained poultry-club medals, the former during the three years of his existence winning at twenty-nine shows the large number of thirty-seven prizes, specials, and other honors. The pullet died in 1896, having won thirty-six cups, prizes, and specials. On no occasion were they shown without being noticed. The other brother of the brood, though not often shown,

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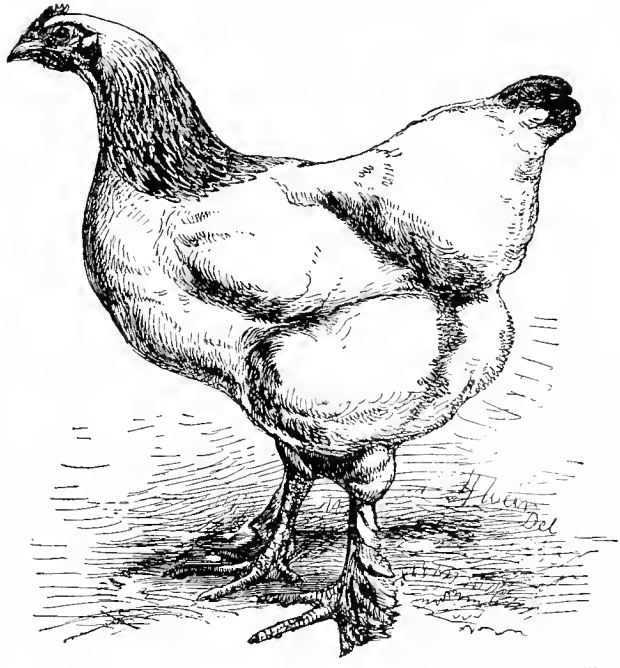
VERY YOUNG LIGHT BRAHMA COCKEREL, 1853

was sent to Redditch, where he gained a first. At the Bath and West of England show he was third, when he was sold, afterward winning a second at Dublin, Ireland. The other hen also won a number of prizes, so that out of a brood of five, so excellent was the strain that four—two cocks and two pullets—were conspicuous by their marvelous success as winners of prizes or honors. Another curious fact should be mentioned, and that is that all Mrs. Campbell's stock are descended from the before-mentioned brood of five or their parents; and yet she has frequently produced brother and sister from the same pen, both being successful when exhibited at the Royal Agricultural Show at Chester in 1893—a brother and sister carried off both firsts. What is still more remarkable is that although the stock has been close-bred, through proper management they have not deteriorated in size, nor indeed should they when inbreeding is rightly understood and practised. Further, the cock with which Mrs. Campbell won at the Royal show in 1899 was one of the largest she has hitherto sent to the show-pen, showing in an unmistakable degree what can be done by systematic selection and matching, no foreign blood having been introduced, with the exception of one hen. Nor is this all. By skilful attention she has produced a strain of non-sitting Brahmas, or nearly so, some of her laying hens not wanting to incubate, while others have been very easily restrained. Her plan was to take away all eggs immediately after they were laid, with the idea—and most likely a right one—that the birds, seeing no eggs in the nests, lost their



By permission of the "Field"

VERY YOUNG LIGHT BRAHMA PULLET, 1853

natural inclination to sit. To this I can testify, having so treated my old English Game hens, with the happy result that some have never attempted to sit at all, and it is therefore probable that a non-sitting strain of old English Game may be established. As to egg-production, the strain of Mrs. Campbell's Brahmas* average about 170 to 180 a year. It should be added that the portrait given of the Dark Brahma cock has been selected by this lady to show the difference between her stock and those in America in the leg and shank feather, a point in which this bird was remarkably good.

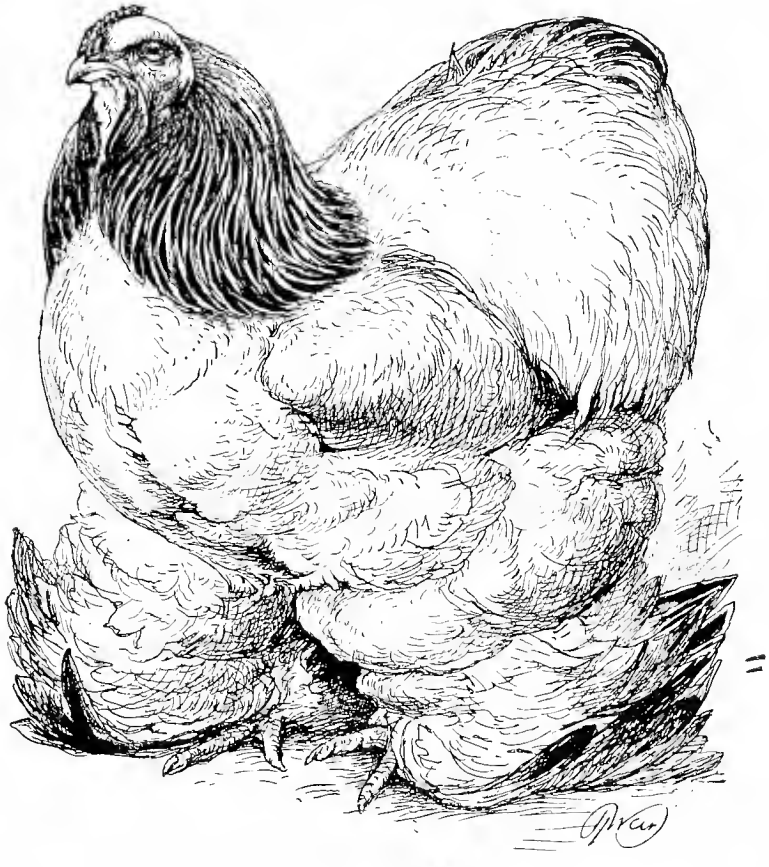
"As already stated, I am not in favor of either the heavily feathered Shanghais or Brahmas, they being a deviation from the original breeds sent here by Mr. Burnham from America in 1853–54. At the Crystal Palace Poultry Show in 1899 I drew the attention of a Shanghai fancier to a very heavily feathered, falcon-hocked White Shanghai cock, and then to a Light Brahma near, equally so feathered, and asked where was the difference between the two, with the exception of the combs, wattles, and the black markings. He at once admitted that in all other respects he saw no difference. Both had dewlaps, were falcon-hocked, and heavily feathered; carriage, bulk, wings, and tail were the same, but the skull was a trifle broader. When the first imports of 1853 were exhibited some had single combs. I made a drawing of a pullet. John Baily was asked if it was like; he answered it was exact. I took it home, traced and colored the copy buff. This was again shown to Mr. Baily as a Buff Cochin or Shanghai, and he said it was very good and true. Shown side by side, he admitted that he believed the Light Brahma and the Shanghai were identical at that time. But when the dark birds of George P. Burnham came we both changed our opinion, believing they were either American Chittagong crosses or some of them, as before described by Doctor Bennett himself in his book written in 1850–53, and when the difference between the Light and Dark was more distinct than it is to-day, but even now to the critical eye it is apparent.

"Since the foregoing was written, giving the facts that came under my own observation regarding the origin of the Brahma as I knew it in England in 1852–56, and later its present development, I am pleased to find that one of America's most venerated fanciers, I. K. Felch, of Massachusetts, an old and reliable admirer of the Light Brahma, has published his

*Mrs. Campbell's Dark Brahmas have been inbred for over seven years.

From a photograph by C. Reid

SCOTCH GRAY FOWLS



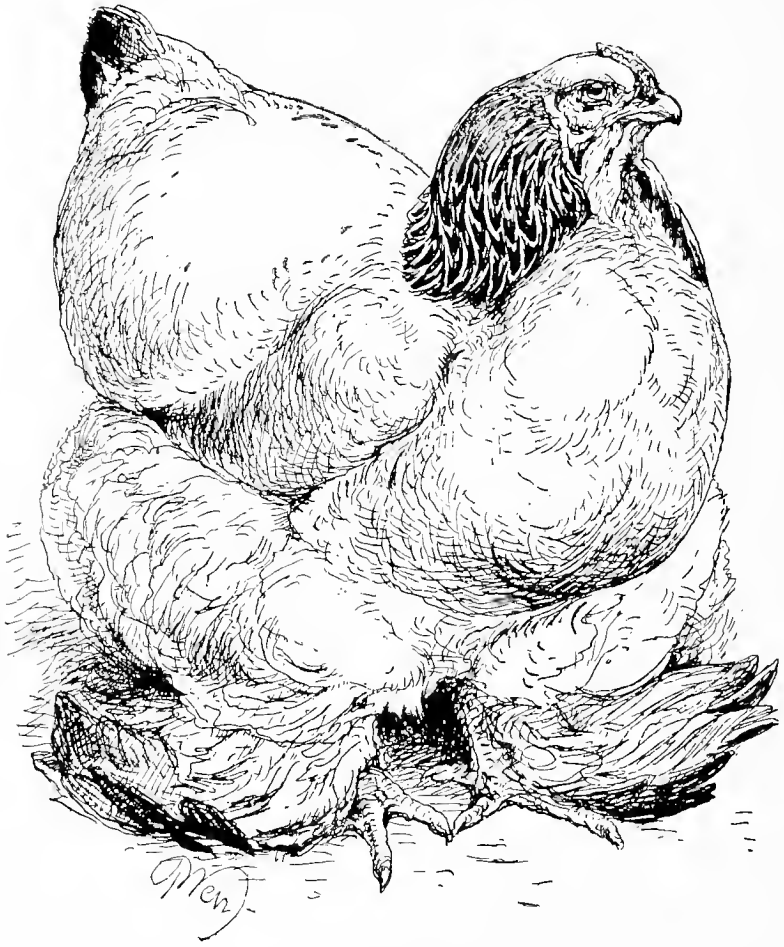
PRIZE LIGHT BRAHMA COCK
Crystal Palace, 1891

knowledge of the history of the breed and what he terms its purity. As it differs somewhat from the statements made at the time and my own of its first importation into England from America, it is but fair and just to give the new record prominent attention. He says in his 'Notes of the Origin of the Light Brahmas,' written expressly for the *Reliable Poultry Journal* and published in June, 1902, that 'the breed which came to us in America completed, if we may use that term. That is, it passed through no mongrel, no transitory state. So perfected was it there that fifty years have failed to make them one whit better. A breeder is not able to-day to produce a bird with a higher score than those we had in 1876.'

"This is possibly true as to 1876, about a quarter of a century after its introduction to public notice, which was in 1851–53, and certainly, as I

have already shown, there was much variation in those imported into this country in 1852–53. Mr. Felch incidentally remarks that at that time (1876) 'one specimen has reached the remarkable score of ninety-seven.' Possibly at the time in America, as was the case here at this date, but not so in the fifties, when the pea comb was only too often conspicuous by its absence."

Nothing could prove more conclusive than the above the vast difference between the fashion of form and feather of the Cochin and the Brahma in England and America.



LIGHT BRAHMA HEN

Crystal Palace, 1896

The American Light Brahma

Those acquainted with the vast amount of testimony for and against the several origins of the Brahma fowl will need no further explanation at this time. Those anxious for more on this subject can be fully gratified in the several English books that seem to be much more interested on this subject than we Americans. It is a pleasure and a satisfaction to the American breeder to give full credit to what is known as the Chamberlain-Cornish original Light Brahmas. A slight reference to this origin will suffice to trace the lineage of the present-day American Light Brahma. It is stated that Mr. Chamberlain, who lived near Hartford, Connecticut, purchased from an East Indian ship-captain some fowls, which he took home with him, and from them started the strain of Light Brahma fowls from which the American fancier selected and bred in line for years until there has been established the beautiful form and feather of the present-day Light Brahma.

Drawn by Mr. Weir
HEAD OF LIGHT BRAHMA HEN

Many of us know that several others made the same attempt, and it is more than likely that some of the blood from those early day attempts has been intermingled with the Chamberlain strain. At the same time, it is fairly well established within the mind of the American breeder, writer, and investigator that the true origin of the American type of Brahma must be credited to that line of birds that originated with Mr. Chamberlain. The greatest consideration and respect is due others that have selected and followed some other line. The American Brahma is an Asiatic fowl which in form, feather, and color is considered to be the best of all the large fowls for general-purpose and utility use.

The most striking individuality of the Brahma is the formation of skull and comb. The head, which is broad, should project over the eye. This makes the skull formation of such a character as to widen out the width of the head. The comb of the Brahma is termed a pea comb, described as a triple comb resembling three small single combs placed parallel one with the other and joined at the rear. Each of these three distinct combs evenly serrated, the large serrations near the center create

the highest knobs or points in the center or midway from front to rear. These combs should never be so large as to be out of proportion, nor should they be small or delicate, the comb of the female conforming to that of the male, though smaller and of finer texture.

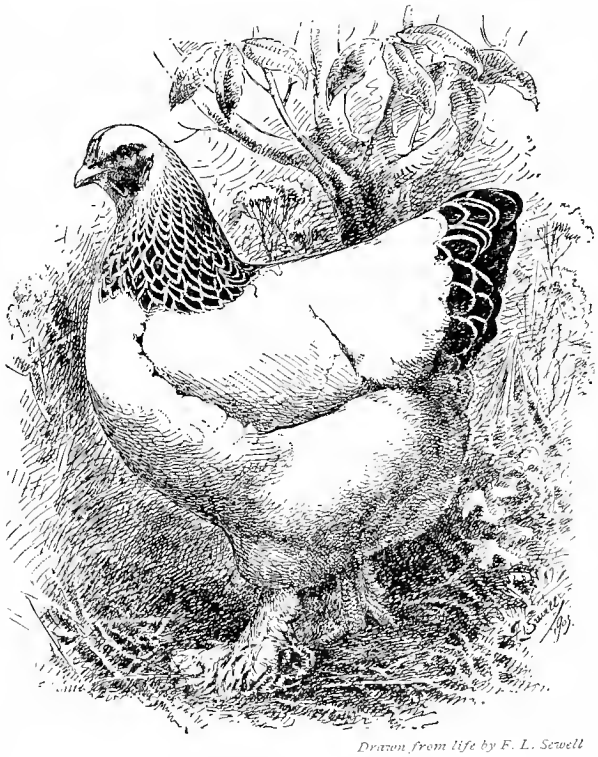
The most beautiful Brahma head has the formation of the beautiful rounded skull that declines gently four ways from the center. The front rounds to the beak, the rear gently inclined to the juncture of the neck with the head. From the center either side over the eye the crown projects, forming a protection or covering, as might be, to the eye. As the birds grow older, at times this skull formation, with the dewlap, tends to give a rather coarse appearance to the head. This, being the result of age, can readily be overlooked where a specimen is superb in other qualities. The well-proportioned and nicely rounded skull that conforms to the size and proportion of the entire bird is most to be desired. This manner of head gives a depth and finish of elegance to the whole bird. The comb of the Brahma should rest upon the head as if part, and not have the appearance of being added or placed upon same. As the crown rests upon the head of the ruler of an empire, so should the comb ornament the head of a Brahma.

The comb of the Brahma, being so much of a distinctive mark to this individual breed, should always be of the most perfect quality. Lower and narrower front and rear, always following the shape of the skull, at times a slight rising in the rear may be present without detracting from same. The most beautiful comb formation is that which starts close to the beak, following the shape of the head and resting rather low at the rear of the head. The juncture of the head with the neck should be apparent; ear-lobes and wattles full and well shaped; what is known as the gullet underneath the beak adds much to the appearance of the head, if not too large or out of proportion.

A medium length of neck that is low-arched and rather heavy as it approaches the body is most desirable. The hackle should widen or spread out as it flows over the shoulders on to the back. The long, sweeping hackle adds much to the appearance of both male and female, always proportionately longer in the male. Much of beauty depends upon the true striping of the hackle of both male and female. This striping must be of a rich glossy black. It should follow the shape of the feather and not run out at the point. This black must be completely surrounded

with white, no taint of color of any kind permissible in the white edging of the hackle feathers. The hackle of the female should be rather large and round toward the end, that of the male pointed. This provides for a broad black stripe in the neck of the female, beautifully edged or laced about with white. Each and every feather of the hackle, extending well up to the juncture of the head with the neck and clear around in front, should be striped with black. The presence of white on stripe in any part of the neck is most undesirable.

The back formation of the Brahma is one of the most distinctive sectional differences between the formation of the Brahma and the Cochin. It should be quite broad and of fairly good length and breadth across the shoulders. There should be a gentle rise from the shoulder to the middle of the back. Here, in juncture with the saddle, there is a slight curved sweep to the tail. The saddle very full; the oval form of the main tail feathers holding up the sickles, saddle, and coverts makes the full formation of saddle about the tail. This is the same in both the male and the female, that of the male being the more pronounced. It is permissible to have some dark striping on the saddle of the male. Coverts of both male and female laced about or edged with white, main tail feathers rich glossy black.



Drawn from life by F. L. Sewell

FIRST-PRIZE LIGHT BRAHMA
Owned and bred by J. W. Shaw, Massachusetts

The breast and body of the Brahma, both male and female, should be

rather longer than these same sections in the Cochin. Breast very prominent, broad, deep, and full, well rounded underneath, with full or prominent abdomen and thighs. Under-body plumage and fluff rather full; shank plumage well rounded over about the hock joint, with no inclination whatever to stiff hock feathers. In fact, anything like a vulture or falcon hock should be disqualified. Shanks straight and well set under the body. As mentioned above, there is an inclination to a bending at the hock which gives the Brahma the appearance of being shorter in leg than should be. This same has a tendency to give the incline forward of the body. While this does not detract so much from the appearance of the female, it does detract from the appearance of the male, creating a forward or stooped appearance which does not belong to the true Brahma. The shanks of the Brahma should be straight and well placed under the body, the carriage more erect than stooped.

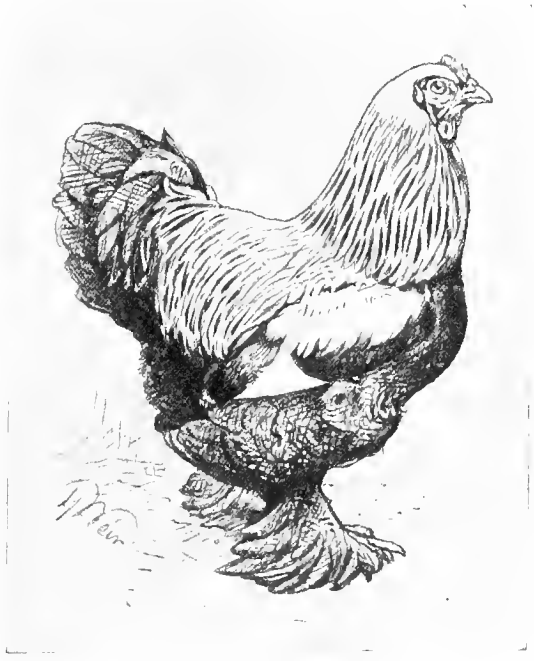
From a photograph by W. Goshawk

LIGHT BRAHMA HEN

First and Special, Dairy Show, 1902. Owned by Messrs. Baily & Son, England

It must be acknowledged that there is an inclination to have considerably more feather upon the Brahmas than in former years. At the same time there is a determinedly strong demand that they shall not be injured through having too profuse fluff, thigh, and shank plumage. The present determination to call a halt to this through the revision of the standard will do away with any possible chance of the utility value of the Brahma being injured. This is undoubtedly a move in the right direction. The Brahma, being the most valuable of all of the meat-producing fowls, should not be injured through the propensity for fancy points at the sacrifice of real value.

The beauty and grandeur of the Light Brahma depend, first, upon its stately formation, which must be true to Brahma characteristics; following this is the richness and distinctive lines between the black and white color; this must be clean-cut and distinct, each free from all shadiness or discolorations or intermingling one with the other. The clean, clear white body color is of vast importance. While it is allowable to have a slate or smoked under color to the plumage, every effort should be made to keep this from tainting the surface color, which should be pure white. The stripings or black centers of the hackle and the coverts should be rich glossy black, the edging pure, untainted white. The beak and shanks yellow; eyes bay, bright, and clear; the wings a beautiful white on the outside or surface; flights black; secondaries black marked with white. The neck plumage under the throat clear down underneath the body pure white, running up to the underfilling of the tail.



DARK BRAHMA MALE

The back and body plumage should be white, with as little black striping as possible upon the saddle of the male. While there is a tendency at this time to have the saddle of the male almost as heavily penciled as the hackle, we think that this is a mistake that will not be continued or countenanced by the most successful producers. The prevalent appearance of black in the web of the feather upon the back of the female is a disqualification. There cannot be any possible excuse for permitting the encroachment of black into the surface plumage of either the male or the female. The pure, clear white with the black in hackle and coverts presents a beautiful combination, but so soon as this black is permitted to crop

out into the back and body plumage the real beauty of the Brahma will be gone.

The tendency is strong for solid black wing flights in both male and female. No one can deny the beauty of this when opened up for exhibition. The having of this has much to do with the encroachment of more black into the body plumage. It is perfectly easy to have these black flights in the cockerels, the same often found in the pullets, but it is injurious to the producing qualities of the Light Brahma to have this black so pronounced as to hold its own or continue the same in the old birds. Flights that are black or nearly so should have the same consideration as the solid black flights; so long as the black predominates in the male and a fairly even distribution of black and white in the flights of the female, you have the safest condition for the reproducing of proper color.

BRAHMA COCKEREL

The richer the black and more glossy in finish the tail of both male and female the better for appearance. The tail of the Brahma female should not be so large as that of the male. It should be well spread at the base, as called V-shaped. This spreading at the base widens out and builds up the cushion into proper Brahma form. When this tail is nicely filled in between the main tail feathers it adds to the finish and elegance of the specimen. The same is true of the tail formation of the male, the color of which should be very rich and glossy.

In the mating for the production of best exhibition quality in Brahmas it is necessary to follow a few absolute rules. First of all, it should be

remembered that no one can be successful in the producing of exhibition Brahmas unless they have had years of experience in the studying of this art. Those who desire to have reasonably fine exhibition quality combined with good utility qualities should mate their Brahmas as follows: Always select in your producing-stock the identical type which you desire to have in the offspring. Have this as perfect as you can obtain it. This will assure your having a fair proportion of the type or shape that you admire. Have color that will be clean, clear, and attractive. Use females of exhibition color mated with males that are rather dark in under color and very pronounced in the color of hackle, saddle, and wings. With such matings you may be reasonably certain of securing quite a large percentage of fairly good specimens. As stated above, the producing of the highest exhibition quality only comes as the result of years of study and experience. Those who wish to work along these lines should select and secure the darkest-colored females that are true and rich in color and pair these with a male equally as dark, always guarding against the encroachment of the black into the white where it does not belong.

The greatest danger along these lines comes from the use of males where the black runs out at the point of the feather. This is always certain to produce smutty or badly colored hackles in both the males and the females. Many of the specimens that will be produced in this way will be of no commercial value on account of their very bad color, but through care in selecting, mating, and a study of the results you will in time build up a strain that will produce what you desire. No one can tell you better than this how to proceed. You must follow along these lines and study out the problem for yourself after considering the results that come from each season's work.

The Dark Brahma

The best authorities of the present describe penciling as being "marked with fine lines, as if with a pen or brush, especially when concentric, as on a breast feather of a Partridge Cochin." This peculiar style of marking belongs to the Partridge Cochin and Dark Brahma females, and other varieties that have been originated through crosses with them and other fowls. There are features of these markings that tend to disprove their actual existence on an early day Jungle fowl in as good form as claimed; these are that it is possible to have the plumage of an individual specimen

penciled as it should be with the lines following the shape of the feather, other feathers lined almost directly across, and others stippled or marked with small dots like a Brown Leghorn female. When, through neglect in breeding, the Dark Brahma or Partridge Cochin begins to run out or lose in color qualities, these several markings are more prevalent, especially the stipple marking.

Among the Jungle fowl that might have been the ancestors of the Asiatic breeds is the Ceylon Jungle fowl. Writing for *The American Poulterer's Companion* (1856), Mr. Bissell states that "their general appearance has much of the Shanghai character; they are exceedingly tame and weigh about eight pounds per pair. There appears to be two distinct varieties of color—one light, the other dark. The lighter-colored ones resemble the body color of the silver-penciled Hamburgs, but on close inspection the markings of the feathers are found to differ materially. The edge of the feather is margined with white, then a brownish-black inner line, then one of white, then a dark center." This describes the present-day markings of our Dark Brahma females. From these may have come the influence that has made possible the beautiful plumage markings of the Dark Brahmas.

The Dark Brahmas have never had equal prominence with the Light Brahmas in America, nor are they generally of as good quality. With some—like Philander Williams, Newton Adams, and the late Charles A. Sweet—the quality has always been excellent. They must be bred up to the highest degree to maintain all the characteristics as well as proper color and markings. There are equal troubles to overcome in both males and females when aiming for proper color and markings. The producing of the nice light steel-gray for females and the clear top color for males is a task of no small proportions. The keeping out of the brown shadings in plumage that are said to have come from crossing with the Partridge Cochins to improve the penciling demands close attention. No one can hope to keep the Dark Brahma up to the highest point of excellence unless the greatest attention is given to the selecting and pairing of the breeding-stock.

For actual value as egg-producers and table fowls they are fully the equal of the Light Brahma. If they had equal attention given them that has continually followed the Lights, no one can tell how beautiful and popular they might have been. There is not a fowl of all the many breeds

and their subvarieties in which there are more possibilities for beauty and real value. They have the size, form, vigor, quick growth, and egg-producing qualities. Their color is suited to any or all localities. None surpasses them for table poultry. All they need is cultivation to bring them fully abreast of any or all of our high-class poultry. They can fill almost any position the fancier may select for them, providing their breeding is guided with care and judgment. There was formerly in England, where the very best of the early day Dark Brahmas were grown, a tendency for two shades of color, the one a rather white ground color closely penciled with dark gray, the other dark-brown penciling upon dark-brown ground.

Photograph by courtesy of T. F. McGrew

DARK BRAHMA COCKEREL
Bred and owned by J. T. Painter, Iowa

In addition to this, some cultivated the dark-brown shadings upon the surface of wings. This tendency toward the brown shade of color in former days has its influence even to the present time over their color and markings. The American demand is for the clear, clean top color and glossy black body color for males and the clear, clean-cut silvery gray for the female, as free as possible of all tendency toward brown shading. Yet with all this many of the very finest hens shown have the brownish cast in their plumage, as have some of the pullets. To be rid of this, great

care and attention have been given to mating for pullets. This has brought to the front again a marked tendency for the white or spotted breasts in males from this line of breeding, making special matings for both males and females almost a necessity. This counts against this breed somewhat; at the same time it is necessary so to mate many of our most popular breeds to succeed with them.

The fashion now in England is for a pure gray ground color, with black or mealy black penciling, uniform throughout, but the massive hock and underbody fluff has destroyed their value to American breeders. Head points of the female specially have been neglected. This, joined with bad hocks, spoils the English-bred birds for America when head points and close hocks are so important. It is to be lamented that the two most successful poultry-producing countries should be so far apart in the rules for breeding such valuable fowls. The most surprising feature of it all is that the English people have drifted so far away from market qualities, in the pursuit of useless and unsightly hock plumage, and the utter neglect of the most valuable meat portions of the fowl in the having of flat-breasted Cochins and Brahmas—a feature most prominent in all fowls that are cultivated to an excessive extent for fluff and stiff hock plumage.

The question of producing exhibition males and females from the one single pair has had considerable attention. That it has been done and that it is a practical proposition is no longer doubted. In the doing of this it is the safest to select the female-bred stock, or, in other words, select from a strain that has been bred successfully in line for females. Select of these the darkest of the males and the finest-colored females, and continue in this manner of selecting year after year. Remember that white markings on the breast of males are not proof positive that he is properly bred in the female line. Know full well the breeding of all the stock you have, and select from the full knowledge of their ancestors rather than for looks. In this way only is it possible to have the quality that will produce the best of exhibition stock.

The early day Dark Brahmas as bred in America differ considerably from the present style. They had a very smoky color throughout the back and body plumage, breast colors very light—often, in fact, almost white in color. This has been built up and improved, as have the Partridge Cochins, until now we have Dark Brahmas with one even shade of ground color and penciling throughout, the neck hackle beautifully marked

with black, the tail coverts and several of the main tail feathers of equally good color. Males are constantly met with that have beautiful body color, perfectly black underbody color, but with all this they are not a favorite fowl with us nor are they as plentiful as they should be. The very best of our American-bred Dark Brahmas are descended from fowls imported from England, changed and brought within the rules of proper characteristics under our standard.

The standard description for shape of the Dark Brahma is identical with the demands in the same direction for the Light Brahma. In other words, the Dark Brahma must be a counterpart of the Light Brahma, the only difference being the color and markings. Having fully described the type or form that is demanded for a Brahma, it is only necessary to give a thorough description of the color demands and how to produce them in the Dark Brahma.

Photograph furnished by T. F. McGrew

DARK BRAHMA PULLET

Second at Chicago, 1903. Bred and owned by J. T. Painter, Iowa

The head plumage of the male is described as silvery white. While this same color description is made use of in describing the top color of the Dark Brahma, it is not a pure silvery white, but more of a grayish white, in fact. The hackle is also described as silvery white with a black stripe in the center of each feather, that tapers to a point. In other words, the hackle should have the black center entirely surrounded by a white edging. This white edging must be entirely free from smoky or dark marking and edgings of any kind. This same is true throughout the entire top color of the male. Wherever the white of

the feathers is marked or marred with dark shading it makes the dark, smutty appearance which is most undesirable.

The entire top color, including the back, saddle, and wing bows, should be of the same clear silvery white, saddle plumage striped throughout the same as the hackle. The saddle should be long and flowing well down about the sides of the tail. When the entire top color is free from dark marks and shadings other than the proper striping of hackle and saddle, you have the ideal top color.

From a photograph by C. Reid

DARK BRAHMAS

One of the most attractive features of the Dark Brahma is the marked contrast between the white and the black top color, the clear, distinct markings of hackle and saddle, and the rich, brilliant glossy black tail that comes up and is surrounded by the coverts and the saddle plumage. The tail should be a rich glossy black throughout and of the same form and finish as the tail of the Light Brahma. Tail formation is of great importance. A narrow, pinched tail is a great defect. The tail should be well spread out at the base and run up toward the center, building out the full saddle and cushion on the back, which makes the proper back formation. Underneath the main tail feathers should be well filled in with curling

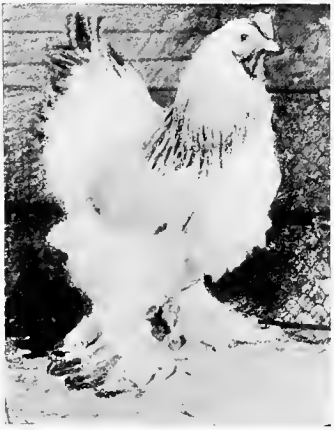
feathers of rich black color. Sickles and coverts glossy, greenish-black, lesser coverts edged with white.

The breast and underbody color should be of a rich glossy black; a slight sprinkling or speckling of white, while undesirable, is not a defect that should count overly against an otherwise well-colored specimen. It is quite natural that the males bred from the female line have these markings, and while the white spots on the breast are not proof positive of having been bred true to the female line, they are usually found upon males that are bred in this way. While you cannot select the proper line breeding from breast indications, it is very valuable to have the proper markings of this kind from a truly bred male that descends from a fine line of penciled females.

The primaries of the wings of the male are black, excepting a narrow edging of white on the lower edge of the lower web; secondaries black, except the lower half of the lower web, which should be white till near the end of the feather, where the white terminates. Shoulder coverts black, wing coverts glossy, greenish black, forming a well-defined bar across the wing. Feathers on shanks and feet black or black mixed with white—the pure black much preferred; shanks and toes orange. While orange is the desirable color for the shanks and toes, most frequently they are found with what is called smoky yellow shanks.

The beak of the female is rather dark, head color silvery gray, neck black edged with silvery white, the black running to a point near the end of the feather. It will be noticed that the form of the black in the feather of the neck of the Dark Brahma is different from the demands in the Light Brahma. In the Light Brahma the black must run nearly parallel with the edge of the feather, while in the Dark Brahma the black running to a point near the end of the feather and conforming to the shape of the feather is the color demand. In Light Brahmas we now have the neck feathers of many of the females quite large and oval in shape, giving a much larger black center than is usual with the Dark Brahmas; this distinction of neck-marking is worthy of consideration. The balance of the body plumage of the female, including the breast, should be gray with a distinct dark penciling, the outlines of this penciling to conform with the shape of the feather; any shafting, dark shading or mealiness of color undesirable. While the standard describes the body color

of the female as gray, there are too many shades of gray not to select among them. The most popular of these shades is known as the light steel-gray; or, as it might be termed, a silvery gray body color is the most admired in pullets.



From a photograph

LIGHT BRAHMA COCKEREL, 1900
Winner of First Dairy Show Cup, Birmingham
Bred by J. Baily & Son

When this color is attained throughout and the entire plumage is nicely penciled with a distinct dark penciling it makes the most beautiful body color for the pullet. We do not think that there is any kind of a fowl more beautiful than is a rich-colored Dark Brahma pullet. It is quite usual for all of the hens to become darker or more brown in body color as they grow older. The lighter in shade the pullets are the lighter in shade will they be as hens as they grow older. The inclination to go brown in body color must come from one or two causes. Undoubtedly the Dark Brahmas and the Partridge Cochins have been crossed with each other to improve the penciling in either or both. There was also an inclination at one time in England to favor the brownish-colored females; all these may be responsible for the inclination toward the brownish shade of color in females. However, the fact exists, and as is natural that it should be the lighter they are able to have the pullets, the lighter will they be as they advance in years. A beautiful colored female carries the richness of color throughout her entire body, including the leg and toe plumage.

The primaries of the Dark Brahma female are black, with a narrow edging of gray penciling on the lower web; secondaries the upper web black, the lower web gray. Main tail feathers black, with more or less penciling upon the upper edge of two or more of the upper feathers of the main tail.

The producing of the best-colored Dark Brahmas makes it almost a necessity to follow what is known as the double-mating plan. This is to have one pen mated for the producing of males, the other pen mated for the producing of females. When such manner of breeding is followed, it

is an absolute necessity to keep the lines separate so as to make it utterly impossible to intermingle their blood. A male bird bred under the double-mating system will almost ruin the penciling of a well-bred female strain.

For the producing of the finest exhibition males, the best male possible to be secured, one perfect in form and color, should be mated to females of good size, shape, and of a dark shade of color. Above all, these males should be bred in line for the producing of exhibition males. For the producing of exhibition females exactly the opposite rule must be followed. Use only the very finest-colored females that have been bred in line for use for the producing of pullets, mated only with males bred direct in line with the female blood. These two lines of breeding must be kept well apart, and it will be found absolutely necessary to guard continually against the loss of Brahma type and characteristics in the female line, as there seems to be a tendency toward the loss of shape when paying so much attention to color element.

Fairly good Dark Brahmas may be bred from a single mating by selecting the very best-colored males that it is possible to secure and mate

Photograph by courtesy of "Reliable Poultry Journal

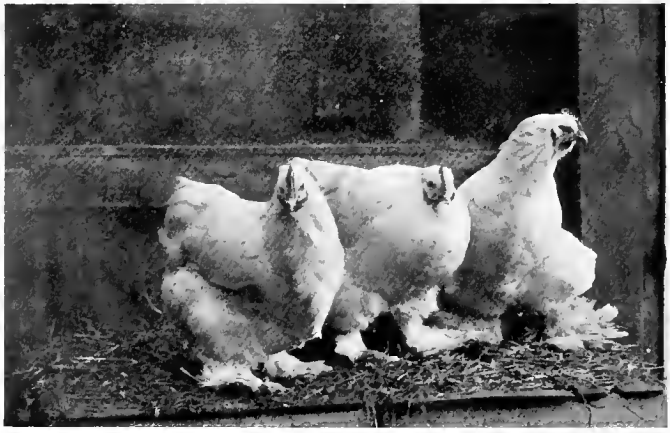
LIGHT BRAHMA COCKERELS

Bred and owned by J. W. Shaw, Massachusetts

them with the very best-colored females to be had; taking the males—the best of them—from this mating and mating them again to the very best-colored females to be obtained, you will gain a start of well-penciled

females and very good males. By selecting the darkest of these males continually and always mating them with fine-colored females you will be able to secure quite a number of very creditable exhibition fowls, both males and females, from such matings. To continue this, always select the very finest-colored females and mate them with the males bred in this same line that are of rather the darker shades of color.

Always and continually keep in mind the proper type and shape of the Brahma. Never be led astray in this. Do not allow vulture hocks or excessive feathering to creep in. Hold continually to proper shape and color and you will succeed. There are a few points of interest in the general make-up of the Brahma that should be constantly considered. It is not proper to have the Brahma stoop at the hock joint or knee, as do the Cochins. The Brahma should stand up well upon his pins, more erect than does the Cochin. The Cochin naturally leans or stoops forward and bends at the knee. This is a defect that should not be allowed to creep into the Brahmas. Keep Brahmas of true shape, proper color, and always select them because they are Brahmas true and pure, rather than because they have an inclination toward Cochin form and feather.



Photograph by courtesy of T. F. McGrew

WHITE COCHIN HENS